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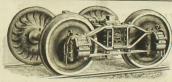
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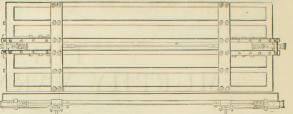
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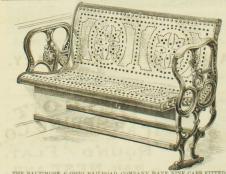
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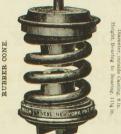
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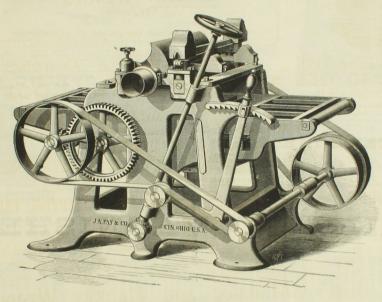
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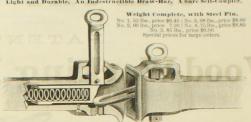
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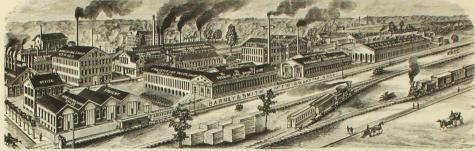
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# THE NATIONAL CAR-BUILDER.



THE INTERESTS OF DEVOTED TO RAILWAY ROLLING STOCK.

VOLUME XI.

MARCH. 1880.

SINGLE NUMBERS, TEN CENTS.

#### Miscellaneous Items.

THE New York & New England road is making arrangements for an improvement of its sleeping-car accommodations between Boston and New

New Jersey, it is learned that the average daily distance traveled by a locomotive is 100 miles; for one month, 2,600 miles. The average cost for men, fuel and repairs for 100 miles is \$12.80.

Great Western from Leavitsburg to Salamanca and from Leavitsburg to Dayton the track will be

of locomotive engines ranges from 500,000 miles to 1,641,880 miles, and under dining and palace cars from 794,000 to 868,336 miles

ing a large two-story brick addition to their ware-The extension is 60 feet long and 34 feet wide.

It is said that a passenger engine is to be built at the Altoona shops expressly to do some experimental fast running. The drivers are to be 6 feet

THERE are now running on the Lake Shore & Michigan Southern road 11 engineers who came from Germany some fourteen years ago, and they are counted among the most reliable engineers on the road.

The Central Railroad of New Jersey is to have 25 new passenger cars built at the works of the Wason Company, Brightwood, Mass., in time for

U

THE rolling stock of the Union Pacific consists of 179 locomotives, 165 passenger and baggage cars, and 5216 freight cars.

As yet, no loaded passenger cars have been precipitated from the lofty tracks of the New York elevated roads into the streets below, but the narrow escapes are so frequent that the occurrence of uch a catastrophe would seem to be only a ques-

THE Chicago & Alton has contracted with the Schenectady Locomotive Works for twenty 40-ton locomotives, to be delivered before May 1. The car stock of the company is being increased in the

THE Allen Paper Car Wheel Co. has been or-Secretary and Treasurer. The capital stock \$1,000,000. The new company intends to build car shops in Chicago.

T. C. Dutro, of St. Louis, is Manager.

THE Marshall Car & Foundry Company been organized to build car works at Marshall, Texas. It is intended to build large shops, thor-oughly equipped with the best tools. Mr. Charles Cobb, of New York, is President, and Mr. John F. Dickson, late of Louisville, General Manager,

THE Philadelphia & Reading shops, at Readin Pa., are building some coal cars 25 ft. long, 8 ft. wide, with very high sides, and carried on two four-wheel trucks. They will hold 20 tons of coal. A THIRD rail is to be put down on the Atlantic & If successful, a number of similar cars will be

THE Barney & Smith Manufacturing Company, at Dayton, O., has contracted to build 300 coal cars The average life of a paper wheel under trucks for the Atlantic & Great Western, to carry 20 tons each. The company is building five postal cars for the St. Louis Iron Mountain & Southern road.

THE Indiana Car Company at Cambridge City THE Crescent Steel Works (Pittsburg) are build- Ind., is building 100 box-cars for the Illinois Midland, 200 for the Indiana, Bloomington & Western and 200 for the Nashville, Chattanooga & St.

> THE Pullman Car shops at Detroit are building Louis and Denver over the Missouri Pacific and Kansas Pacific roads

> THE Grand Trunk shops, at Montreal, are building 1,000 new box-cars for use on the road.

THE National Dispatch Line has contracted for 100 Tiffany refrigerator cars, to be added to 100 preliminary steps for organizing a national society already in the line.

Mr. John Dolan has been appointed Road-Master of the Menominee River Branch of the Chicago & Northwestern. He has been conductor can Society of Mechanical Engineers. of a construction train on the Peninsula Division

Mr. C. D. Law is appointed Road-Master of the Western Division of the Pittsburg, Fort Wayne & Chicago, vice Robert Learmouth, resigned.

THE Safford Draw-Bar is steadily making its way on prominent roads, nine additional roads having adopted it during the past month. Within the past year upward of 22,000 have been put upon ears, which is a convincing proof not only of its utility but growing popularity

THE Michigan Car Co., at Detroit, is building 100 Tiffany refrigerator cars, and the Missouri Car & Foundry Co., St. Louis, is also building 50.

ganized as successor to the Hudson Paper Car completed 300 cars for the Kansas Pacific, and 400 clusively in his control for a mile below the station. Wheel Co., with A. Gilbert Darwin, President; for the C., C., C. & I. They have contracts also for John E. Gillette, Vice-President; James C. Beach, 850 more cars, divided among five different roads, feet long and 26 feet wide. The bridge, 75 feet is and are turning out a goodly number of street span, is now being thrown over these tracks

Jacksonville, Ill., but not occupied until now. Mr. keep it busy until July, and has just refused

THE Plumbago Oil Company, of Rochester, (manufacturers of French's Plumbago Oils are full of orders, both domestic and foreign. The business of the company is increasing rapidly, a trial of its oils having satisfied railroad men that the use of them prevents hot journals and saves a large item of expense

MR. F. M. WILDER, lately promoted from Division Master Mechanic of the New York, Lake Erie & Western, at Buffalo, to the position of Superintendent of Motive Power and Machinery for the whole line, with head-quarters at Susquehanna, Pa will have charge of the entire car equipment of the road. He intends to have freight and passenger cars of standard construction, with uniform patterns of such parts as can be made inter-changeable. Mr. Wilder is a very capable mechanic, and in his former position won a deserved popularity

THE Gilbert & Bush Co., Troy, N. Y., is busy with freight and passenger work, comprising 200 box cars for the Wabash, and 150 for the New York & New England, also 50 freight cars for Brazil; 15 Wagner sleepers, 6 passenger cars for the Southern Pacific, 2 for Troy & Boston, 2 for Detroit, Saginaw & Bay City, 2 passenger and 27 freight cars for Nicaragua. It is also repairing 300 Merchants'

A LARGE number of mechanical engineers met on the 16th ult., at 96 Fulton street, New York, to take to facilitate the interchange of views, reading of papers, etc., respecting improvements in mechanical science. The society is to be called the Ameri-

J. A. FAY & Co., manufacturers of wood-work ing machinery, at Cincinnati, O., have orders three

THE House Committee on Patents, to 3, has refused to extend the Miller Platform and Coupler patent, on the ground that 17 years limitation. It is stated that Col. Miller has received upward of \$253,000 for his patent since it was granted in 1863, but that a large portion of this amount has been absorbed in expens

The Boston & Lowell R. R. Co. is perfecting a system of switching, at Lowell, by means of which one man in a room in the roof of the new station Foundry Co., St. Louis, is also building 50.

THE Cleveland Bridge and Car Works have just the main track. The 16 or 20 sidings will be ex-

THE Old Colony road is overburdened with shops in Chicago.

MR. W.M. H. BARNUM has sold his interest in A NEW company, with a capital stock of \$50,000, the Rochester Car Wheel Company, of Rochester, and the Jacksonville Car Co., has been organized to run the car shops built several years ago in K. Chapin, The company has orders in hand to Webster, "to be used for passenger or freight trains, are now nearly completed; a large freight engine is also building at Taunton

THE equipment of the Lehigh Valley railroad includes 238 engines, 71 passenger cars, 36 baggage and express cars, 24,461 coal cars, 1088 eightwheeled house cars and 1449 stock, platform and other cars. There has been an increase of 3 engines and 200 cars the past year.

THE Pullman Company has closed a contract with the Denver & Rio Rrande Railway Company for operating its palace cars over this narrowgauge line. The line will be established with ten sleeping-cars, two or three of which will be suplied within the next thirty days. The contract is limited to fifteen years

THE Michigan Central shops, at Jackson, Mich. are building 17 passenger and freight engin The former will have a capacity for hauling 20 heavy coaches. The boilers are 52 inches in diameter and have 196 flues. The fire-boxes are 6 feet long, and the cylinders  $18 \times 24$ .

A NEW sleeping coach called the "Manhattan designed to run from Boston to the West Hoosac tunnel and New York, Lake Erie & Western, combines all the latest improvements of the Pullman Company. The ceilings are of oak, elaborately decorated with designs of flowers. The berth fronts are inlaid with different varieties of wood, such as satin-wood, teak, French walnut, amboyna, etc., in new designs. The seats are upholstered with the standard crimson plush used by the company. The gentlemen's toilet compartment and smoking rooms at one end of the car, and the ladies' toilet compartment at the other, are finished in solid mahogany. The interior is divided into twelve sections, which, with four berths in a section, gives sleeping according dations for 48 persons. Another new feature is the Hicks & Smith hurricane lamp, for which is claimed the merit that no smoke from it can get into the car, and that even a hurricane cannot extinguish it.

Dr. Horton, of reclining-chair renown, has de vised a process of heating and cooling passenge cars by distributing heat generated in the bag gage car through the entire train. This is done by inside pipes and connections. For cooling purposes, the air is forced through a coil of pipes embedded in ice. Experiments show a variation of 38 to 190 degrees on a moving train, and also his ability to maintain the temperature at any point between these extremes

THE Connotton Valley Railroad, of Ohio (nar row gauge), has just been opened from Cleveland to Canton, a distance of 58 miles. Its business is Friction Axle Box in its application to railway car panies leasing them in April, May and June. It is the transportation of bituminous coal almost exclusively. It is exceptionally well built, having 35-pound steel rails, white oak ties 18 inches from centre to centre, Howe truss bridges and well constructed masonry. The coal cars are made to carry 13 tons (same as standard gauge) 100 of which The enterprise is of Boston origin, and is wholly represented by Boston capital.

A NEW car-stove fire-extinguisher has been in vented upon a plan similar to the Babcock principle. It is attached to the stove by a tube through which the charge from the extinguisher escapes into the stove when the car reaches an angle of 45 This bottle is in two parts, held together by a rubber band, and is connected with pendulums at right angles, separate from and independent of each other. into the stove, extinguishing the fire.

The practice of locking passengers in railroad both inner and outer boxing to prevent lateral mooaches is a custom that would never be tolerated tion. The advantages claimed for this invention in America. It would stir an irresistible impulse are as follows: in the liberty-loving bosom of the average American to kick the door open. There is even in Eng- as the length of the axle journal, there is much land a sort of mild idea of this kind afloat. A gentleman who has traveled a good deal in England narrow-faced wheels says that most of the knowing passengers there provide themselves with small square keys that so many journals running at only a quarter of the will unlock the door of the carriage. Those nervous passengers who do not like to travel with locked doors, yet have no key, can easily make one with a piece of silver of the requisite size. Strange as it may appear, the door is unlocked in this way by slipping the silver into the guard's hand.

A CORRESPONDENT of the American Machinist power says: Thirty years ago it required 1800 days' labor to construct a locomotive; now it will not exceed 1500, and a far superior machine in every respect. There are 16,000 locomotives in the United States. and there are over 2800 different pieces in each, all of which will have to be renewed every 10 or 12 years. Locomotives that retain their identity 20 years or more, as claimed by some roads, are not far from 1700 locomotives per year, and the different roads build in their own repair shops Axle-Box Company, Sumce, Out about 100 more, making 1800 a year in all. Now, addressed for further information. allowing 15 years as the average life of an engine you will see that the shops can build 27,000 in the long time to come

1. The face of the friction wheels being as wide less liability to cut or indent the journals than with

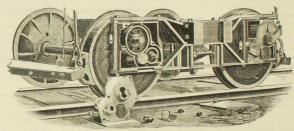
2. The weight of the car being distributed upon speed of the main axle, it is impossible for them to heat if properly lubricated.

3. As there is an actual leverage afforded by the friction wheels of more than 75 per cent to overcome frictional resistance, a train must necessarily draw lighter, and thus effect a saving in motive

4. The consumption of lubricants will be much less than in ordinary running. The parties, indeed, guarantee that a car mounted upon their boxing will run 1,000 miles with one oiling, and that the journals will not heat at a speed of 50 miles an hour

As to the liability to get out of order and the ne cessity of frequent repairs—the great trouble with something like the boy's jack-knife which he had car friction wheel apparatus heretofore tried—we 10 years, but it had 9 new handles, and 13 new are not informed. The invention is adapted to blades. The present capacity of all the shops is both steam and horse-car roads. The proprietors and patentees are the Montross Anti-Friction Car Axle-Box Company, Simcoe, Ontario, who may be

THE United States Rolling Stock Company has mean time, showing that the present capacity of issued a circular to railroad companies notifying our locomotive shops need not be extended for a them that it is building, at Chicago and Urbana, 500 box-cars, to carry 20 tons of freight, and



MONTROSS ANTI-FRICTION CAR AXLE BOX.

journals. The box is shown with the face or outer very likely that this matter of carrying such heavy cap removed, and also with the cap in place. The loads in freight-cars will soon occupy the attention axle journal is supposed to be the standard size of track engineers, as having a tendency to affect (3%×7). Above it, but about 15 degrees from a the economy of their department injuriously. vertical line, is a friction wheel 101/2 inches in di- Which is to be the policy of the future—light cars ameter and 7 inch face, with a 21/2 inch steel spinhave been put on the line within the last month. dle passing through it having a journal at each It does not seem in the nature of things that a car end and running in brass boxings fitted in the casng, one form of these brasses being shown in the foreground of the cut. On the side of the journal weight. This is a vital subject and ought to be opposite the brake, is another and smaller friction wheel, 61/2 inches in diameter and 7 inch face, wnich serves as a shoulder or abutment, both wheels running in line. The spindle of the small legrees. The extinguisher contains a bottle with wheel is 1½ inches in diameter and runs in soom, stepped on her dress and "wrecked the sulphuric acid suspended above the water and boxing like the large one. Underneath the jours be more car-full in future. nals of both wheels are large oil cups formed in the casing and extending into the annular spaces of the wheels. Connected with the cups are channels When these pendulums are moved to an running to the edges of the casing, through which angle of 45 degrees by a heavy jar, a fall of the the journals are oiled and the waste supplied or car, or a collision, the bottles in the extinguisher removed, the channels being provided with suitable Engineer of the New Jersey Central, and later of car or a condision, the bottes in the extinguisher removed, the channels being provided with suitable are broken, the ingredients are mixed, and the ble covers to keep out dust and dirt. The early of the New York Elevated road, has accepted the pocarbonic acid gas is formed at once and escapes has the usual collar and shoulder between which the friction wheels revolve, thus making use of Car Works at Troy, N. Y.

The engraving illustrates the Montross Anti- that it will be prepared to deliver them to comand light loads or heavy cars and heavy loads? can be devised that will carry economically a heavier load than one and a half times its own

A YOUNG man, while attempting to fix a "mis placed switch" on a young lady's head in a ballroom, stepped on her dress and "wrecked the

The brakeman of a passenger train looks forward to the time when he shall be conductor. freight brakeman merely looks out for bridges.

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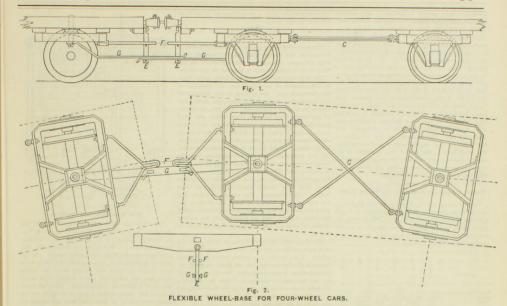
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ing the two axles of four-wheel cars on the radial bolt the levers E, which pass between the arms F line of curves. Fig. 1 is a side view of such a car, and through slots in the guide-bars G. These atand a longitudinal section of part of another car tachments are not placed between each car of the single axle trucks of the same car, with their operation of this plan is as follows: When the train connections, and also certain other connections is on a straight track the guide bars G will keep with the preceding car which will be described. The object of the inventor is to control, by means of the construction shown, the trucks or axle-frames in the centre of track and the axles at a right angle so they can not turn or rotate on their centres with the rails. When the cars strike a curve, while on a straight track, nor avoid doing so however, the guide-bars become a chord in the while on a curve. To accomplish this, he connects curve and carry the lower ends of the levers with the two trucks by the diagonal rods C, so that it, and the arms F following the lever movement, when one turns on its centre, the other must also cause the trucks to rotate and the axles to conform turn to the same extent, but in an opposite direction. This, however, is not claimed as any new by the suspended levers E until the cars leave the It has been tried with slight modifications curve. many times, but with results that were not satisfactory, and for the following reasons: When the be built to weigh not exceeding 9,000 or 10,000 forward axle of a car so constructed enters a pounds, and with a carrying capacity of from 10 curve, the outer wheel, owing to the longer distance it has to travel, slips back, and by means of frames as compared with cars having no trucks at the connecting rods the rear axle throws its outer all, is deemed a trifling consideration in view of wheel forward, thus causing the line of the axles the diminished wear of track and wheels, the to deviate more from the centre of the curve than if they were rigidly at right angles with the car motive power. This plan will at all events be inback on entering the curve, and the two axles will ning four-wheel coal and box cars with rigid axles for the moment, as it were, strive for the mastery; and a 11-foot wheel base.

Drawings and working models may be seen at and as the inner rail strongly resists the advance.

Drawings and working models may be seen at machine is in the form of an attachment to the ordinary steam hammer, consisting of dies placed of the forward inner wheel, the acts yields and the office of Mr. Geo. C. Betts, 60 Wall street, in the hammer and bed, to cut the iron to its proper in the hammer and bed, the intervention is not be in the iron to its proper in the hammer and bed, the intervention is not in the iron to its proper in the ir axles, instead of pointing directly toward the curve centre, point within the radii.

From this it is plain that if by any means one of the axles can always be kept at a right angle with the rails, the other must necessarily be kept so. The Terre Haute Car W. To do this the inventor uses a light guide-bar G Ind., have contracted to built made of flat iron, and in two pieces, the inner ends the Cairo & Vincennes road. being attached to the king-bolts of the two cars, as shown. Directly over this bar, and attached to tional order from the New York Central for 1,025 under a 5000-pound steam hammer, and by a few the truck frames, are two projecting arms F. From box cars.

THE above drawings illustrate a plan for keep- the centre of the end-sills is suspended from a hoop

to 12 tons. The additional weight of the axle longer service of cars, and the lighter tax on the The outer wheel of the rear axle also slips teresting to the roads that are building and run-

THE Indiana Car Company, at Cambridge City, Ind., has taken a contract to build 100 cars for the Chicago, Pekin & Southwestern.

THE Terre Haute Car Works, at Terre Haute, Ind., have contracted to build 850 freight cars for

THE Harrisburg (Pa.) Car Company has an addi-

#### Damages for Injury to a Yard-Man.

The Detroit Post and Tribune of Feb. 10 says: The case of John L. Smithson against the Michigan Central in the Superior Court for several days past, was concluded with a verdict for the plaintiff for \$5,000 damages. Smithson was a yard-man in the Michigan Central yard, and his hand and arm were caught between the bumpers of two freight cars, and he was so badly injured as to be incapacitated from further labor. The cars were Erie cars, and were provided with 'dead-woods,' a device which is considered extremely dangerous, and which has been discarded by the Michigan Central on its own cars. The plaintiff was not aware that the cars in question had 'dead-woods,' and before he knew it his hand and arm were caught, he slipped, and was dragged along the track and had a narrow escape from being killed. Counsel for plaintiff claimed that it was gross carelessness on the part of the railroad company to make use of such cars, and that, therefore, it was liable for the injury to its employé. The case will undoubtedly go to the Supreme Court.

### A Machine for Making Coupling Links.

Mr. Stephen Uren, a foreman in the blacksmith department of the Central Railroad shops at Sacramento, Cal., has invented a machine for the manulength, curve, bend, lap and weld the links. This is all done with such rapidity that the iron does not lose its heat from the time it is first taken from the furnace until it is complete in links. The re-fuse pieces of wrought iron are weighed out and put up in the usual way for blooms, placed in the furnace, and, when brought to the proper heat, they are then taken, one at a time, and placed strokes are formed into billets of four inches square

furnace, and from thence through the rolling mill, are very nearly alike. which forms it into bars of the size desired for links. These bars, which are left by the rolling mill at red heat, are at once placed in the link machine, when by a single stroke a piece is cut off of proper length for a link, and the ends scarfed. The piece is then placed under another die of the machine, and a stroke upon each end curves them in shape to properly form, when brought together, one end of the link, while a third stroke with an oval die upon the centre of the piece forms it into perfect link shape, with the scarfed ends neatly lapped together ready for welding. It is then brought to welding heat, when it is again put into the machine, and with a single stroke the link is perfected and ready for use. The capacity of the machine is 1000 links per day, requiring 66,000 pounds of iron. The work done by the use of this machine is ac complished in about one-fifth the time required for the same number of men by the old process, and with corresponding economy in fuel

#### Prices of American Steel Rails for Twelve Years.

The following record of the prices (in currency of American Bessemer steel rails at works in Pennsylvania per ton of 2,240 lbs., from 1868 to 1879, inclusive, has been prepared from reports of actual sales for the American Iron and Steel Association, and published in its Bulletin.

Years.		January	February	March	April	Мау	June
1868 1869 1870 1871 1872 1873 1874 1875 1876 1876 1877 1878 1879		\$165 145 110 95 10414 121 11736 71 67 49 41	\$1671/6 1431/4 110 96 104 120 1171/6 71 65 49 411/4	\$174 135 10836 106 10434 12236 115 71 62 49 4136 42	\$172 134 107 85 11114 12014 9878 69 62 49 42 42	\$165 130¼ 106 103 110 120 98⅓ 69 62 47¼ 43½ 42	\$162½ 128 109¼ 104 113 121¾ 69 60 46½ 43 45
YEARS.	July	August	September	October	November	December	Yearly aver-
1868. 1869. 1870. 1871. 1872. 1873. 1874. 1875. 1876. 1877. 1878. 1879.	\$150 130 110 10344 11434 12134 91 69 59 4534 4339 45	\$150 130 110 104 115¼ 121¾ 89¼ 69 59 44¾ 42½ 48	\$150 130 10834 106 114 118 7844 69 56 44 4234 50	\$150 13014 10114 10534 11334 120 7814 67 54 4234 4234 52	\$148 130¼ 102¼ 105¾ 118 120 75% 66 53 40¼ 42 63	\$147½ 120 98 106½ 120¾ 120 75¾ 65 52 40½ 41 68	\$15834 13234 10634 10232 112 12014 9434 6834 5914 4534 4234 4836

#### Locomotive Boiler Explosions

The Railroad Gazette publishes a table which gives a total of 139 locomotive boiler explosions within the past eight years, and calls attention to the curious fact that the number of such explosions in cold weather is considerably greater than in summer. Thus, in the six warm months, April, ployés about the car were the conductor and porter, May, June, July, August and September, there and that the conductor was absent during a run of were, during the eight years, 55 explosions, while 84 miles, while the porter was busy cleaning boots during the same number of years there were 84 ex plosions in January, February, March, October November and December. For January of 1872 there was no report of accidents made. sion, if supplied, would probably make the difference still more apparent. The three winter months, if compared with the three summer months, give a proportion of 42 explosions during the former to 23 in the latter. With the omissions for January, 1872, added, in all probability it would make the proportion of very nearly or quite two to one. The three spring months, compared with the three

They are then passed immediately into another autumn months, give a proportion of 35 to 39, or

#### The New Railroad

The year 1879 was a joyful one to many towns in Kansas as the happy time which brought their first railroad, the most gratifying event in the history of a municipality in Kansas or elsewhere.

The first railroad, like the first baby, is the best It is the source of boundless joy, the fountain of numberless hopes. Every step in the progress of the locomotive toward the fortunate settlement ses increasing excitement. The day the smoke of the engine can be seen from town, the local press may be said to be heated; the day the "iron horse"-that's what they always call it-rolls in on the new-laid track, the aforesaid columns burst into a blaze. If the day of publication is too far off, the American Eagle spreads his wings and the silent cannon vomits its printed smoke at the head of an "extra." The population turn out en masse; the convivial get drunk, and the sober are rather sorry that they cannot concientiously join their festive fellow-citizens. The enthusiasm does not die out for three weeks, at least, for there is the great excursion where a countless multitude crowd into four coaches and go somewhere, no matter where, so that all bands return tired as dogs at

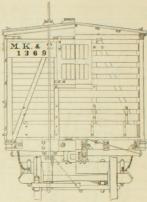
The gloss rubs off every thing in time, and the new railroad becomes in a very few years an old affair. Many people who voted bonds for it, and brought the flowing bowl to aid them in their rejoicing when it was completed, live to say that it is "an infernal old monopoly;" that the Superintendent is an overbearing tyrant, the Station Agent a blockhead, and that the Mail Agent throws off

his sacks at the wrong places.

Neither the old "jubilantes" or the later growlers are exactly right, but the former are much nearer right than the latter. A railroad is a grand, good thing. It does not make a metropolis of every town it reaches, but there are few towns it does not improve, and no town, in exchange for the lifting of any amount of its bonded debt, would be deprived of one after having once enjoyed it. Kansas is the railroad State, hence the proserous State, and in no year in her history has been fuller of brightness than 1879.—Atchison Champion.

A CASE involving the liability of sleeping car companies for the loss of the personal effects ssengers, has recently been decided by the Indianapolis Superior Court, in the suit of Diehl vs Woodruff. A judgment was rendered for plaintiff at special term and affirmed at general term, for watch and money valued at \$396, the evidence showing that the property was stolen from his berth while he was asleep during sleeping hours. The grounds of the decision are that the passenger having contracted for sleeping accommodations, and the company having agreed to furnish them, it is bound to use such care as the contract implies, inasmuch as the passenger can not sleep and exer cise personal supervision over his property at the same time. It seems that in this case the only em 84 miles, while the porter was busy cleaning boots long -thus leaving the car with no protection against

TRAINS," says a fashion report. They are awfully plain. Once in a while when they make up a freight train from the red, blue, and white lines, and put in an oil tank or two, there is a little variety; but there won't be any thing really artistic in trains until Barnum gets on the road with those cars frescoed with blue monkeys, yellow tigers, purple ele-phants, striped snakes and things, engaged in bloody and mortal combat.



End Elevation and Section

THE drawings show the construction of the Standard Stock Car of the Missouri, Kansas & Texas Railway, designed by Mr. Geo. W. Cushing. Superintendent of Machinery, at Sedalia, Mo. The principal specifications are given below. gard to these cars it may be said that they have been found to stand the rough usage to which stock cars are subjected much better than many They are used. others of a different construction. indeed, for many other kinds of freight-for alnost every thing, in fact, that will not injure by exposure to the weather, including iron, coal, stone, lumber, etc. The end-doors are designed for the admission of railroad iron and other long freight. The inside is frequently sealed up with thin matched stuff so the cars can be used for transporting corn or grain in sacks. This method of utilizing them for different kinds of freight has been found to work better than the regular combination box and stock cars which have been tried on the line; but Texas shippers would not ship live-stock in them

#### GENERAL DIMENSIONS

Total length of each sill, 28 ft. 14 in. Width of body, 8 ft. 414 in. Height from under side of sill to top of plate, 7

#### BODY TIMBERS.

2 outside sills, of Norway pine or best clear northern tamarac,  $8\times41_5\times27$  ft.  $51_4^{\circ}$  in, long over

2 intermediate sills, of same material and dimen-

2 inside sills, of best white oak, same dimen-

2 end sills, of best white oak, 8×5 in. at ends, 9×5 in. in centre, by 8 ft, 41/2 in. long

2 needle beams, of best white oak, 8×4 in. × 8 ft. 414 in. long over all.

2 plates, of Norway pine, 6×3 in. × 28 ft. 14 in. 2 end plates, of white oak, 3×6 in, at ends, 3×12

in, in centre by 8 ft.  $6\frac{1}{4}$  in, long over all. 7 inside carlines, of white oak,  $4\times1\frac{1}{4}$  in, at ends, and straight on under side, 8 ft.  $10\frac{1}{4}$  in, long over

1 centre rib, of white oak, 3×2 in., 28 ft. 14 in.

4 side ribs, of white oak, 214 x 1% in., 28 ft. 14

8 diagonal ribs, of white oak,  $4 \times 7_8$  in. 2 transoms, of white oaks,  $13 \times 5$  in., 8 ft.  $4\frac{1}{4}$ 

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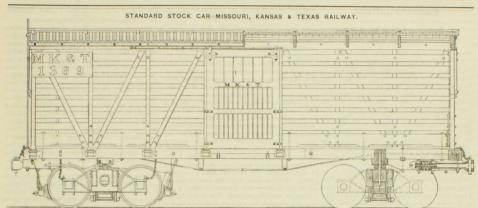
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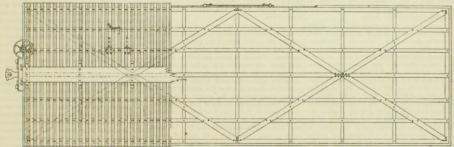
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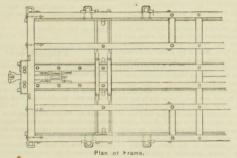
1 ft. 44



Side Elevation and Section



Plan of Roof.



2 buffer blocks, of white oak, 9×51/2 in., 2 ft. in. long.

4 draft timbers, of white oak, 8×41/2 in., 4 ft. 101/4 in. long.

4 corner posts, of white oak, 51/2 × 3 in., 7 ft. 11/4 in. long over all.

12 intermediate posts, of white oak,  $3 \times 3\frac{1}{2}$  in. 7 ft.  $1\frac{1}{4}$  in. long over all. 4 end door posts, of white oak, 4 × 2% in. × 6 ft.

8½ in. long over all.

16 braces, of white oak, 21/4 × 4 in., 7 ft. 4 in. long over all.

2 ladder braces, of white oak, 134 × 81/2 in., 7 ft. 114 in. long over all.

4 side base boards, of southern pine, 10 in. wide paint. 2 in. thick, 11 ft. 3 in. long. 28 side slats, of southern pine.  $5 \times \frac{1}{28}$  in., 11 ft. 3

6 end slats, of southern pine,  $5 \times \frac{7}{8}$  in.  $\times$  8 ft. bers of clear white oak.

3 in. long 16 end slats, of southern pine, 5 x 3/8 in. x 8 ft.

wide, double, and joints overlapped.

Running board, of white pine, 16 in. wide by 11/4 thick

Floor of yellow pine 1% in. thick (finished), and not over 9 in. wide, tongued and grooved. Floor to be slatted.

#### CONSTRUCTION.

Transoms capped with east-iron plates 34 in. thick by 41/4×13 in. across ends; five 1/4 in. rods across body of car at top; four 7 in, cross trussrods; 2 side doors; 6 ft. 6 in. long by 4 ft. 9 4 in. wide, framed of white oak; 2 end doors, 2 ft. 4 in. wide, 2 ft. 11 in. long; 2 trap doors in roof, 22 in. long by 16 in. wide, strap hinged; four 11/8 in. truss rods from end to end of car, with turn-buckle in centre; king-bolt 1¾ in. wrought-iron, 2 ft. 4 in. long; brake wheel 14¾ in. diameter and set 2 ft. above roof casting; brake beams, of white oak  $3\frac{1}{4} \times 7$  in. centre,  $3\frac{1}{4} \times 4$  in. ends, 5 ft. 9 in. long; all outside woodwork to be well painted with mineral paint, and iron work with one coat of heavy black

Trucks same as for the road's standard box car. [See Car-Builder for Sept. 1879.] Washburn's n. long. 2 end base boards, hinged, southern pine, 10 × 2 nn, × 8 ft. 3 in.

| South |

FIREMEN are utilized in two ways Either they are promoted to be engineers, or are tried out for 2 brake beams, of best white oak,  $3\frac{1}{4} \times 7$  in. at centre, and  $3\frac{1}{4} \times 4$  in. at ends; 5 ft. 9 in. long.

Roof of white pine, best quality,  $\frac{4}{4} \times 3\frac{1}{4}$  in. times his weight.

#### Communications.

#### The Cracking of Paint on Passenger Cars.

To the Editor of the National Car Builder .

It is a fact well known to railway men that the cracking of paint on passenger cars is the cause of much annovance to car painters. The subject has been much discussed, with an earnest desire to discover a remedy, but as yet no very satisfactory results have been reached. The cracking still continues, and many of the best finished coaches that have been in use two or three years on our principal roads are found to be more or less defective m this cause. Car painters have in the course of their investigations discovered some of the reasons for the trouble. Each master painter, or foreman, has his own ideas as to the causes and the remedy, but at the same time is slow to admit that there are any cars with cracked paint on his own particular road, although others can see them very plainly. In the course of my own experience I have given special attention to body work. This, as it seems to me, is the essential point. Mere decoration is well enough in its way, but the most difficult part is the foundation; and as every car painter has his own individual views about cracking, I will venture to give mine.

I do not know of a road whose cars are entirely free from this defect. If there are any such roads I should be glad to learn their names. I do know however, that there is less trouble from this cause upon roads that have light colored cars. In a pre vious communication a few reasons were given why this should be so, and I will merely say here that this is a fact which no argument can set aside, and I say it with all deference to the opinions of your correspondent, "F. B. G., of the Hub," in your February issue. My own belief, confirmed by much experience, is that the primary cause of the cracking of paint on cars is the seasoning of the wood and consequent shrinking of the fibers. paint that has cracked, it will always be noticed that it still adheres firmly to the wood, but the doubtless many other causes that are as yet imwood has contracted and broken the surface of the Now, if the paint could be prepared so it would expand and contract with the wood in all changes of weather, there would be no danger of cracking; but ordinarily in priming a car all the oil is given to it that the wood will absorb, and then less oil is used until the finishing coat of color is reached, which has very little oil in it. This coat is, therefore, brittle and easily disturbed, there is far less elasticity in the color-coat than in the wood or priming coats, and it would be strange indeed if it did not crack and show after a time what is called fine spongy color-cracks, but which do not have much depth, thus indicating that the flat colors are the cause of this kind of cracking. A car can be finished with oil color only, using no japan or varnish, but simply linseed oil slightly boiled to get the water out of it, and a small quantity of turpentine to make it work free, and the paint will not crack because the coats are all prepared alike and have the same elasticity as the wood. This method, however, will not give a finish suited to passenger cars, and is of no con quence except to show that the wood and paint will in this way resist equally the tendency to expand and contract. Wood never gets so well seasoned that it will not shrink, especially in warm, dry weather. The hot summer sun and the drying and bleaching winds of autumn injure paint more than the steady cold winter or spring months do. Heat is the most destructive element we have to contend with. It draws the life out of the paint, and the darker the car the more it draws the heat, ceasing to use quick-drying varnishes, two of the while light colors have a contrary effect. Upon principal causes of the cracking of paint on pasthis point Mr. Gardner's "opera-glass" may be of senger cars will be avoided.

ne service perhaps to car painters who are unable with their natural eyes to discern the difference in the durability of colors. A finely finished car suffers much from sudden extremes perature. A panel may be painted and kept in a uniform temperature for years with no signs of cracking, but let it be exposed on the roof of the shop and the effect will be visible in a few months

I have said that wood never gets through shrinking, and will say further, that coarse-grained wood will shrink most, and, of course, will show paintcracks most. It is often wondered at that some side-panels show cracks, while others on the same car do not. The cause is owing to the difference in the grain of the wood, the former being coarse and knotty, and the latter closer and finer, holding the paint and admitting the oil into the fibers better. Hard woods, under exposure to weather-changes, do not hold paint as well as soft woods, the paint being more apt to scale, for the reason that the oil does not penetrate and adhere as well. A slight opening of a joint will take up moisture which will creep along under the painted surface; all of which shows that finishing-lumber for cars should be carefully selected. The shrinking process is perceptible even in cars that have been in use ten or fifteen years, when stripped of their old paint and repainted. So long as the wood has any life or strength left, it will expand and contract

Another cause of paint cracking is the changes of weather while the paint is being applied, and especially the varnish when it has to dry in a damp shop, and in damp weather when it will absorb moisture. Varnish is more affected in this way than paint, and the remedy is in having the tem perature of paint shops properly regulated. I am also of the opinion that good ventilation is indispensable in shops, and that the want of it in numerous cases prevents the escape of the vapor which forms from the drying of painted and varnished surfaces, and causes it to settle back on the work, imparting an enameled surface to the var nish, destroying its lustre and retarding the hardening process. Combined with these there are perfectly understood. What I have said are merely suggestions of my own experience. But to come directly to the most prolific cause of paint cracking, we undoubtedly have it in the too free use of quick rubbing varnishes. That this is so there is an abundance of proof on all sides, and I venture to say that but few practical car-painters will deny the fact. Many a job is hurried through with these varnishes, when, if a varnish was used that would rub in not less than six days, we should discover that the quicker a varnish dries the less it has of wearing quality. It lacks the most essential ingredient, which is the oil, and has, therefore, no elasticity. It will not only crack itself, but the quick rubbing will destroy a good job of painting underneath. Another cause, which is the fault of the painter, is the excessive use of oil and japan. Oil should be used just sufficient to bind the colors well, but it should dry down flat in from six to eight hours, instead of the same number of minutes, for I claim that color is just as liable to crack by not having enough oil in it, as it is by having too much, and herein I disagree with some of the craft, who think that color cannot be made to dry too flat, and who give it only oil enough to spread it on the work, and flatten down as soon as it is laid off. I have long pursued a medium plan, and with good results. Color requires oil in sufficient quantity to give a solid surface when dry, otherwise, it is porous, and will absorb the varnish, instead of holding it out, and giving protection BUCKEYE.

The Cost of Cars-Settlement for Cars Destroyed-

To the Editor of the National Car-Builder There is no circumstance of recent occurrence which has so much surprised general managers and purchasing agents of railroads as the extraordinary increase in the prices of materials entering into the construction of cars. I hear that the manager of a Western road, who wanted more cars, telegraphed a few days ago to a car-building firm to build him "as soon as possible, 500 cars exactly same as last lot just delivered, price and terms same as before." The answer was, "If we build you 500 cars, same price as before, we shall lose \$88,000." Those who were fortunate enough to get cars before the "boom" ought to be happy. but, naturally enough, they are not; they are annoyed because they did not contract more. At the present date, axles, bar cast iron and hardware, cost more than double what they did eight or nine years ago. The axle-makers had a convention at Cleveland a few days ago and put up the price of axles to 51/2 cents per pound, and, excessive as this price may appear, it is undoubtedly justified by the high rate at which scrap iron is held. Wheels are selling round here for \$16 to parties who only a few weeks ago were paying \$9.50 for the same pattern. Pine is also becoming more costly, and oak is hard to get at any figure. One practical reflection to be made on these facts is that the Master Car-Builders' rule for making settlements for cars destroyed by accident, is apt at this juncture to affect un-favorably the owner of the cars. I heard an instance a few days ago, where the M. C. B.'s rule was sought to be applied in the case of a car broken up. The car was in good, fair, serviceable condition, but was nine years old. plying the rule of allowing \$425 for the value of the car when built, and deducting six per cent. per annum for depreciation, the sum of \$196 would be the amount payable for the car. As the car-an old one in good condition-was worth \$500, and as a new car could not be built to take its place under \$675, this mode of settlement did not strike the owner of the car destroyed at all favorably. I think the assumed value as the basis of settlement for cars destroyed ought to be determined once in three nonths by a committee of three master carbuilders. \$700 would be nearer the average value

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DETROIT, Feb. 21, 1880.

#### The Lack of Uniformity in Car Construction-Who is Responsible for it?

To the Editor of the National Car-Builder.

Much has been said and written during the past few years about the advantages to be derived from uniformity in the construction of cars; but, in ac cordance with the old adage, it all appears to go in at one ear and out at the other, for little or nothing comes of it. Thousands of cars have recently been built, and from all accounts, thousands are being built, therefore, no better opportunity could have presented itself for adopting the resolutions passed by the Master Car-Builders' Association; but, from an inspection of the cars, it is evident that little or no attention has been paid to the important points so often discussed by them at their meetings. From this apparent apathy, the question may pertinently be asked, What is the reason of this, and who are responsible for it? Surely there are among railroad officials many who must be alive to the saving to be effected in the working of their departments, and who, if they were untrammeled and in a position to follow the bent of their own inclinations, would adopt some course which would, at least, provide for a uniformity in the building of their own cars, and so far show some consistency in themselves, and thus by their influence endeavor to induce others to follow their

the writer might venture an opinion, he would say that general managers and superintendents are at nowhere, or only conspicuous by its absence. least somewhat to blame in the matter, for they have only to say the word and request their master car builders to carry out the resolutions they have indersed at their conventions year after year and then, if not carried out, know the reason why

In these days, when interchanging of cars is the rule and not the exception, common sense would seem to indicate that all those parts liable to get out of order should be made similar in pattern, so that the material to be kept in stock and ready to replace damaged or broken pieces might be reduced to a minimum. At present, it is necessary to keep they can do something in reference to the future if a dozen kinds of axles, and over a score of patterns of axle-boxes and brasses; also as many draw-bars and connecting pieces, and a like variety of brake attachments, pedestals, guides, centre-plates, hangers and other fixings. Just imagine for a moment the magnitude of this heterogeneous mass of mate rial, which must be kept in stock by such roads as the New York Central, Erie, Lake Shore and others, where thousands of cars pass daily. Why, the quantity must be estimated by thousands of tons, representing a dead capital of some hundreds of thousands of dollars; and yet, perhaps, none of those roads are capable of supplying all the requirements of half the foreign cars running over

Now, who is to blame for this? Are the mas ter car-builders? If we take their own words as answer, it surely cannot be them; for, have they not, one and all, declared and voted in favor of a grand uniformity, beginning with a standard axle, deservaxle-box, brass, and key, and their surroundings Have they not resolved to adopt a standard system of screw-threads, that an occasional lost nut might be replaced in the twinkling of an eye, and from an ordinary stock, instead of having to rumm through a boxful to find one that at best is only a misfit? Have they not decided on the proper dimensions for a standard draw-bar, having a fixed length, width, and thickness, that do not in any way interfere with anybody's patent rights, and may be made of either cast or wrought iron? Have they not agreed on fixing the brake-mast on the left side of the car as you look at the car end, and on putting the ratchet-wheel and pawl on the roof instead of on a bracket at the end, and about a them and in other hands

roads that are least interfered with by the superior roads centering at Chicago, there is use for advertisement page 50.

formity to be the panacea for existing evils; but if you please, the cars of any one of our large why so many new Pullman coaches are built withpractice has not confirmed the remedy, and hence roads, and compare like parts with like, and it is out them, and why these windows in many of the practice as in arises. Who are responsible for it? If ten to one that nine out of every ten will be unlike old cars of this company are being paneled up? in some of their component parts, and uniformity On most roads first-class cars have two saloons and

> hypothesis to show that there is something wrong not be filled from the car roof or from the inside as to the manner of car-building, and it is there- of the saloon, consequently they should not be fore of no use any longer to shirk the question as placed in the saloon to avoid obstructing the end to who are responsible; for the answer is too palpa-windows. The creaking often noticed in the ends ble, and must be admitted as a fact, that master of old cars is caused, more or less, by end windows, car-builders themselves are chiefly to blame for all because the necessary braces are wanting to hold this lack of uniformity, and the sooner they set the roof frame square with the bottom framing, themselves about the task of rectifying the evil the better it will be for all concerned

> only they will carry out the meritorious resolutions passed by themselves at their conventions. The writer would also suggest that general managers and others assuming control over the building of new cars, should consult with their master builders as to the details of construction, and insist on having the matter of uniformity duly con sidered. New line-cars should, as far as possible be made on one model, and as the truck and draftgearings of old cars require renewing, they should be reconstructed after the new model. These advantages would entail no serious expense on the a greater degree of safety. Mack. owners, but on the contrary, owing to the simp licity of a uniformity of patterns, both new and old work could be effected more readily and with much greater economy, and in due time those expensive and abortive attempts at novelties which are now to be seen in the shape of car attachments, would be consigned to the oblivion they so richly JOHN ORTTON.

St. Thomas, Ont., February, 1880.

#### Are End Windows in Cars of any Use?

To the Editor of the National Car-Builder The suggestion made by me in the January CAR BUILDER that end windows in cars are unneces has, I perceive, been made the subject of some critical comment in a prominent railway journal, the writer of which favors end windows on account of the "fascinating view" they afford of the scenery along the route. But, so far as my experience goes, this view is most of the time very far from fascinating, because it is either almost instead of on a bracket at the end, and about a choot below the roof? Have they not indorsed the wishes of the brakemen and yardmen in promising wake of the train. Another drawback is, that, to to keep the ends of their cars, when coupled to- look out of end windows, one must ride backto keep the ends of their cars, when coupled to-gether, at a distance apart not exceeding two feet, so that the stepping from car to car might be done easily, if not safely? Have they not admitted the fact that the occupa-car of a train, when it comes in from a trip, and of a car, and especially if it is the last that the stepping from car to car might be done easily, if not safely? Have they not admitted the fact that the occupa-car of a train, when it comes in from a trip, and this gives no snow, either Have they not admitted the fact that the occupation of a train, which is the fact that the fact that the fact that and see how the dust, cinders, or snow, gather do all in their power to ameliorate their condition? on the platform and on door and window sills, The published record of their doings answers in the The assertion made by the writer in the journal affirmative. All these, and a host of other pro-referred to, that stoves obstruct the view from end positions have been so emphatically endorsed by the master car builders, that surely any lack of in accordance with the facts. I do not know of a adoption must be for the reason that they are trunk line north of the Ohio River where stoves are owerless to act, and that the remedy lies beyond taken out of cars at all in summer, except it may be a few that are used in excursion or suburban Now, if this is the fact, it is desirable to find out trains. Just imagine the Lake Shore, or the Pennwith whom the power rests, and where the brakes sylvania Company's roads taking out the patent are being applied which stop the progress of such common sense improvements. Let us put the met as well as winter, or in Hillinois Capital Cap superintendents the obstructionists? If the writer is too warm to have firee at Cairo, and when the daims that it is considered by the greater part of should answer the question from his own expering in the transportance of the railroads in the United States and South ence, he would unhesitatingly say, No: Certainly cold enough to have two stoves in full blast in America the most effective for saving brasses and not! On the contrary, he would say that those every car. On northern and east and west cooling journals of any lubricant now in use, See

example. But of the hundreds of roads on this powers, are the greatest offenders in producing the vast continent, where is there one that has followed many of those heterogeneous ments that the course suggested? Precept has declared uni-which there is just cause to complain. Examine, should have end windows. If so, I would ake two stoves. Of what use are end windows in such Sufficient, Mr. Editor, has been said by way of cars? Water-coolers, for obvious reasons, should remedy is to take out the windows and put in long braces running from the corner-post at tie-rod through plate and sill down alongside of door post. This will not spread the car, but will keep the frame square, and relieve the end sill of the great strain of the draft-rigging. This matter I will ex-plain more fully at another time, when I propose to say something with special reference to car fram-

It seems to me that the small advantages of end windows are exceeded many fold by the benefits resulting from their disuse, viz.: diminished cost of

#### A New Wrought-Iron Car Wheel.

Mr. A. J. Stevens, the General Master Mechanic of the Central Pacific R. R., has invented a wrought-iron car wheel, the cost of which, it is said, will not exceed that of the ordinary cast-iron wheel, while it is much lighter in weight, more durable and less liable to accident. In making the wheel, the rim and hub are forged by machinery into two circular sections, with recesses in the sections of both rim and hub to receive the spokes. The spokes, which are made in the form of an ellipse, with rib in centre of each side for increase of strength, are placed in position in these reces and the two parts of both rim and hub brought together, thus forming the wheel, but consisting of eighteen pieces, there being fourteen spokes in a wheel. The whole is then taken in that position and placed in a furnace, by the use of a large pair of tongs made for the purpose and operated with the furnace-crane, and when brought to the re-quired heat for welding is placed under a fivethousand-pound steam hammer, in which are dies of the desired form, and with three strokes it becomes a perfect wheel and ready to receive the steel tire, which is fitted and shrunk on in the and this new wheel is 250 pounds each in favor of the latter, which difference in an ordinary train of forty cars will amount to forty tons, or four full car loads of shipping weight.

MR. VANDERBILT has ordered a full restoration of the ten per cent reduction in the pay of the employes of the New York Central & Hudson River road, made some three years ago, the same to take effect March 1.

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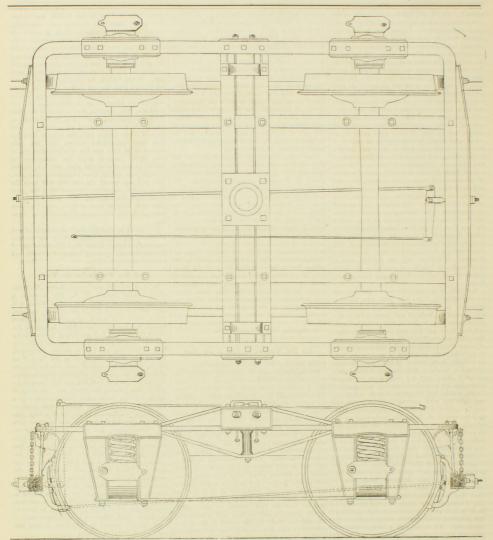
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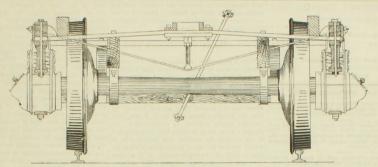


IRON FREIGHT CAR TRUCK-BOSTON & ALBANY RAILROAD.

grades. The arch-bars secure the requisite vertiviates the necessity of knocking the entire truck
cal stiffness in the centre. Outside brakes are to pieces in order to repair it. The wheel-base is
used, suspended from truck-frame, and the pedes5 feet 1 inch.

The engravings on this and the opposite page represent a plan, side view, and transverse section, of the continuous iron frame freight car truck of the Boston & Albany Railroad. The contribution is so clearly shown as to require but little explanation.

The frame consisting of but one piece of iron (SRP4 inch), is not liable to get out of square in running over a line with sharp curves and heavy crades. The archibars secure the requisite vertical states of the safety-beams and proved in the bars being bent on formers and the holes register facts, to be utility interesting the properties of the provided of the continuous transportation. The only parts that are of wood are the safety-beams and bolster. The various parts are interchangeable; New York Central having just contracted for 1,200 crades. The archibars secure the requisite vertical security of the provided of



their pay-roll, and will manufacture boiler plates, rails and bridge beams, as soon as their furnaces and machinery are in complete running order. The Kellogg Bridge Co. has a force of 120 men-and is engaged on contracts for bridges for the Lake Shore, Canada Southern, Iron Mountam Texas Central and other roads. The Delaney Forge & Iron Works are working to their full capacity and erecting new and improved machinery on a large scale to meet the largely increased demand for car axles. The Howard Iron Works employ 200 men on full time in the manufacture of The Gilbert Car Works, recently established in Buffalo, are rapidly getting under way in the effi-cient charge of Mr. Geo. W. Miller, and are now building 200 box and 150 gondola cars for the Wabash, St. Louis & Pacific, with some very large contracts about closing which will keep them busy for some time to come. The outlook for a large business on the lakes was never better. The King Iron Works are building two double compound 600 horse-power engines-one for the Union Steamboat Co, and the other for the Western Transportation Co., also several engines of less capacity for other parties. Other works in the same line are equally busy. There is a large demand for vessels for ore transportation from Marquette and Escanaba to Cleveland, Erie and Buffalo, rates having advanced to \$3 from the former place and \$2 from the latter, for the season, and which are equivalent to 6 cts. per bushel for corn from Chicago to Buffalo. There are also many sales of vessels at greatly advanced prices as compared with prices a year or two ago.

#### Emigrant Sleeping Cars.

Chicago papers say the Union Pacific Railroad is about to make a new departure in the way of a further concession to the comfort of its emigrant passen gers. Under this dispensation travel in second-class coaches will be quite a different thing from what it has necessarily been heretofore. The passengers will not be obliged to "camp out" or nap in their seats, but will enjoy in a measure the luxury of a refreshing sleep. The coach is to be of the ordinary size. It is furnished with seats made of light wood and set in iron frames, and with berths which fold up like those in Pullman coaches. Both the insures cleanliness and coolness. The seats fold up when in use during the day, and at night are ex-tended to form the beds. The upper berths are divided by a partition about four inches high, which prevents any selfishly inclined passenger from occupying a whole one. There are six secforty-eight persons. rangements are simple but sufficient. All the roads, and even on the same roads.

present emigrant car equipments of the road, com-

#### New Publications.

Car-Builder's Dictionary; An Illustrated Vocabu-lency of Terms which designate American Railroad Cars, their Parts and Attachments; compiled for the Master Car-Builders' Association, by Matthias N. Forney, M. E., assisted by Leander Garey, Supt. Car Dept. N. Y. C. & H. R. R. R., and Calvin A. Smith, Secretary of the M. C. B. Association. Published by the Railroad Gazette, 73 Broadway, New York, Price, \$2; six, 5½ s Sinches, 400 pages.

This long looked-for book has at length made its appearance, and we shall be disappointed if it is not appreciated in proportion to its need. It is not necessary to refer to the causes that have delayed its publication, as they are, or ought to be, very well understood by the members of the Car-Builders' Association who first suggested its importance and took the incipient steps in its preparation. The magnitude and difficulty of the undertaking have been realized only as the work progressed, and by those only who performed the labor. Nobody is at fault for the delay, much less are the compilers, who are entitled to the thanks of the Association for the perseverance with which they have prosecuted the task they have so long had in

The book, as its name implies, is a dictionary or vocabulary of names applicable to the various parts of railroad cars in common use, systematically arranged for convenient reference. There is a general index, which is followed by the dictionary proper containing an alphabetical list of about 2,500 names or terms with their definitions, with cross-references after the manner of Knight's Me chanical Dictionary, wherever necessary. part is printed on tinted paper and comprises about one third of the volume. The residue consists of 300 pages with 800 engravings, showing all the different parts of cars, their attachments, furnishings, trimmings, etc., classified, named and numbered and forming the most complete collection of this class of illustrations ever published. The whole arrangement is such that when one becomes a little seats and the berths are constructed of slats, which familiar with it by use, the illustration of any part of a car may readily be found, as well as its name, definition, etc. In order to render the volume more compact and practically useful, the compilers have very properly excluded many things, such for example, as the names of the different materials used in car construction, the aim being to furnish aptions on each side, and each section contains two propriate names for the various parts of cars and double berths, giving car accommodation for put an end to the confusion caused by the use of The heating and toilet ar- different names for the same parts on different

It is a work that has long been needed to enable prising about twenty-five coaches, will be con- car-builders to understand one another, not only verted into the sleeping car pattern as soon as it when communicating by letter or telegram, but can be effected. The rates for the use of these cars when talking together in their conventions. This will not be raised from those charged for the ordineed is, moreover, constantly growing in consequence of the increasing interchange of cars, and after the long waiting for this unique little volume—the only one in existence, we believe, upon American railroad cars-it remains to be seen whether the car-builders will make it the efficient means of establishing a common language where there is now a Babel of confusion. The work, although not absolutely free from defects, is far more perfect and complete, we will venture to say, than many peo ple of a critical turn of mind may, at a cursory ance, be led to suppose. Its merits can only be fully appreciated by study and daily use. It can not of itself do away with the prevailing chaos of terms, but is only the instrument by means of which the end is to be attained. No other or better work of the kind is likely to take its place very soon, and if this one is not turned to some practical account the time and labor expended upon it have been wasted. Every railroad man, and especially every car-builder, should get a copy at once, because the more widely it is distributed the more effectively will it serve the purpose for which it is designed.

The American Engineer; An Illustrated Journal devoted to all Branches of the Engineering Profession.
Published, Monthly, Willard A. Smith, Managing Editor, Smith & Cowles, Publishers, Chicago, Price

The February number of this new publication is very attractive in its appearance, and in the variety and quality of its contents. It is in quarto form, well printed on fine tinted paper, and contains pages of reading matter exclusive of cover. The publishers announce that a number of prominent engineers have been secured as contributing editors. and that the paper will be both original and valu able as a record of engineering progress, not only in this country but throughout the world. Notwithstanding the numerous home publications of this class, there is ample room for more. Our vast railway system, and the activity in mechanical construction, invention and scientific discovery generally, present an inviting field for technical journalism. The publishers have long been identi-fied with the *Railway Review*, and their experi-ence thence derived will enable them to appreciate the wants of the engineering profession, as well as the growing popular demand for the information of which the new journal is to be a medium. success can hardly be a matter of any doubt.

Ir is stated that there are more than 2500 varieties of American apples. And yet the train boy never offers you any except the same cld thing split-leather paring and saw-dust filling, with a bass wood spool for a core.

#### The PUBLISHED MONTHLY

R. M. VAN ARSDALE,

5 DEY STREET .....

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JAMES GILLET, Editor.

MARCH. 1880.

#### EDITORIAL ANNOUNCEMENTS

Subscription.—ONE DOLLAR a year in advance, post-age prepaid. One copy will be sent free for one year to any person sending us five new subscribers.

Addresses.—Business letters should be addressed, and drafts and money orders made payable, to Tux NATIONAL CAR-BUILDER. Communications for the attention of the Editor should be addressed EDITOR NATIONAL CAR-BUILDER

Advertisements.—Nothing will be inserted in this journal for pay, KXCEPT IN THE ADVENTISING COLUMNS. The editorial department will contain our own views and opinions; and the rest of the reading matter, aside from advectisements, will be such as we consider of in-

Contributions.—Articles relating to railreay a stock construction and management, and ke topics, by those who are practically acquaintee these subjects, are especially desired. Also early of changes in railroad officers, organization names of companies.

Special Notice.—As the Car-Builder is printed and ready for mailing on the last day of the month, adver-tisements, correspondence, etc., intended for insertion, must be received not later than the 25th day of the

COPIES of the CAR-BUILDER will be kept for sale, and subscriptions received, by A. WILLIAMS & Co 283 Washington street, Boston, Mass.; and by L SCHAFFNER, Cigar and News Dealer, Grand Pacific Hotel, Chicago, Ill.

WE desire to thank our friends, who have favored us with club lists of subscribers within steam from being cut off entirely by the accumu the past two months. These, with the single subscriptions, which are increasing every day, will add largely to our circulation

WE have made, in this issue of the CAR-BUILDER, a large number of corrections in our Directory of the pipes. roads and road-officers, from returns received from a very large number of roads, so that it is changes that are constantly being made. We again request that readers will give us prompt notice of such changes, errors, omissions, etc

in this city of the representatives of the car departments of a leading trunk line and its Western connections, for the purpose of agreeing upon the construction of a box freight-car, to be accepted and adhered to as a standard by these roads. What progress was made in the matter we are not advised, but will only say that if these roads can't agree about the details of such a car, there is not ently of the locomotive, and circulated through the much use in agitating the subject of a general standard

It has been decided by the road that in all ne trucks of this pattern, iron bolsters will be used instead of wooden ones.

A CORRESPONDENT, whose practical knowledge of the evils of diversity in freight-car construction enables him to speak advisedly, presents his views in another column. What he says is none the less deserving of attention because the subject is a little attached a Worthington pump, and a double set of ing such year. Information is to be furnished to threadbare. Every railroad man, and especially those in charge of repair-shops on the great East and West lines, knows all about the difficulty complained of. The great question is: Who is respon- without any material waste in volume, or even in are forbidden, also discriminations between shipsible for its continuance? Our correspondent gives temperature, if the pump is run at a high speed, as pers for like and contemporaneous service on the

roads, and with the Car-Builders' Association, we are of wrapped rubber, the pipes are joined are inclined to think his theory about the responsibility may possibly be the true one.

THE WARMING OF PASSENGER CARS

There is perhaps no one thing in Mr. Charles F. Adams' book on Railway Accidents that is treated so unsatisfactorily as the matter of heating passenger cars. Some of the worst accidents that have occurred upon our roads have resulted from the use of stoves for heating purposes. In Europe, where cars as a general thing are not warmed by fires, the wrecks of trains have rarely if ever been rendered doubly horrible by conflagration. Although a great many methods have been proposed in our country for making cars comfortable in winter without the use of stoves, none of them appear to meet all the requirements, or if so, they have not been generaly adopted. The ordinary wood or coal stoves, although they are so exten sively used, are admitted to be unsatisfactory in many respects, and numerous attempts have been made to improve their construction so as to render them less dangerous in cases of collision and the overturning of cars.

The experience of the New York elevated roads in the use of steam for warming cars is suggestive of some important points which deserve the atten tion of inventors who are at work upon the prob lem. Stated briefly, the general system consists in forcing steam from the engine through pipes running lengthwise through the trains, the pipes being jacketed with galvanized iron, and the intervening space filled with sand for the purpor storing up the heat. In moderate weather, the cars are by this means very comfortably warmed but in very cold weather there is not only a lack of the requisite warmth, but a very considerable waste of steam. In order to prevent the supply of lation of water in the pipes from condensation, it is necessary to let the steam blow off at the end of the train, and at each of the couplings even. use of sand for storing heat does not seem to obviate the necessity of constantly blowing steam into

This evidence, however, is hardly nece explode the theory of heating cars with steam now as nearly correct as it can be, considering the from the locomotive. It is impracticable for reasons that have been set forth again and again. It is quite manifest that if stoves are ever to be su perseded by any other method, it must be by the use of hot water, supplied either from the loca WE hear that a meeting has recently been held tive boiler, or from a heating apparatus in each car, or else from a general heater in the baggage car for the whole train. Taking either water steam from the boiler is practically out of the question. A fire for the purpose in each car would be equivalent to a stove as a source of danger in case of accident. So that, in order to make hot water available for all trains, it must be heated independpipes by means of a power distinct from the engine. The practicability of this plan has, in fact, been very well tested within the past year by the Pennsylvania Railroad Company. Something more than a year ago a train was fitted up with an apparatus for warming the cars with hot water, the an answer-from his own point of view, of course; it can be in severe weather, when more same line of road. Rebates in every form are pro-

National Car-Builder, and considering his position and relations with the heat in the cars is required. The couplings across the end of the rear car so as to complete the circuit, and valves are provided for emptying the pipes of each car when not running. Combined with the system there is also a ventilat ing apparatus, and registers under the seats for regulating the temperature. We are informed by Mr. McCrea, the Superintendent of the New York Division, that this system has worked and is working admirably, and has required no changes or modifications, to speak of, since the first trial of it was made. A second train has recently been fitted up in the same way. It will of course be suggested, in the way of drawback to such an arrange ment, that the first cost is considerable; that 12 feet or more of longitudinal car space is required; that a man must be constantly employed to run the pump and boiler; and that the cars so equipped can not be interchangeable in winter with other trains. But all this amounts to but little as compared with getting rid of stoves and the attention they require, to say nothing of the far greater safety in case of accident and diminished risk to property and life from conflagration.

#### FREIGHT-TRAIN BRAKES.

A correspondent writes us in reference to the doubts that are entertained by many railroad men as to whether it is possible to construct a freighttrain brake that will meet all the requirements of such an appliance as set forth in the reports of the committee of the Car-Builders' Association. He claims to have perfected a brake that will "fill the bill." and says that it is ready for exhibition. "It is automatic in the true sense of the word, the power is derived from the momentum of the train and is as great or greater than that of any air or vacuum brake, it has no coupling but the ordinary link and pin, can be applied to each car in the train independently of the others, and the retard ing pressure increased in proportion to the weight of load upon each car respectively.

In accordance with his request, we print the above for the benefit of those who are on the lookout for such an invention. We would suggest to him, however, that similar claims have already been made by other inventors, and that they amount to very little apart from the actual performance of the brake upon moving trains. put to the test it may not fully justify his claims This is the important point to be determined, and we would recommend him to communicate with Mr. C. E. Garey, of Morrisania, N. Y., who is chairman of the committee on freight-train brakes. This committee is on the lookout for just such a device as our correspondent claims to have invented.

#### RAILROAD LEGISLATION IN CONGRESS.

Federal supervision of railroads, so far as interstate commerce is concerned, has assumed a slightly new or modified phase. A substitute for Mr. Reagan's bill has been adopted by the House Committee on Commerce, and will be considered by the House, in all probability, at no very distant day. The new bill provides for the appointment of three commissioners to exercise supervision over all railroads that are not exclusively within the limits of one details of which were given in the CAR-BUILDER state or territory, with powers only to investigate for April, 1879. It consists of a horizontal boiler and report in respect to the operations of such roads which occupies, with its fixtures, about 12 feet as affecting interstate commerce. A railroad year lengthwise of the baggage-car. To this boiler is is to be prescribed, and a system of reports coverpipes which make the circuit of the train with a loop under each seat. Through these pipes the hot loop under each seat. Through these pipes the hot water is forced continually, returning to the boiler counts. Unreasonable rates on interstate traffic

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hibited, and any arrangement to prevent continuous are no criterion for contracts now. Not only have all the great majority of travelers need or care for. carriage without break of bulk. The provisions of the act are not to apply, however, to any shipments greatly advanced, but such is the pressure to get furnish. An attempt to please every body can of less than a car-load, nor to any within the limits orders filled, that managers cheerfully wait their never be entirely successful. of a single state.

The arguments and representations of the leading experts in the science of railway transportation. Mr. Fink, Mr. Blanchard and others, seem to have had their effect on the committee by inspiring its members with some degree of self-distrust as to their ability to frame a law, during the brief moments of respite from partisan electioneering, to regulate railroad business in all'its multitudinous details and complications. The more these legislative Solons really find out about it, the more will they realize their own incapacity. In the provisions of Mr. Henderson's substitute nothing is said about prohibiting a higher charge for a shorter than for a longer distance, nothing about posting schedules of rates; and the pooling business is only made a subject of inquiry. This indicates an advance in the right direction. A right understanding of the condition and working of railroads should precede the enactment of laws for the regulation of traffic. They are already subject to the code pertaining to common carriers, and any further legislation that may be needed to regulate railway interstate com merce should be based on the kind of information that a national commission composed of capable men with the requisite authority, can collect. It is not at all likely that this bill will speedily become a law. It must first pass both Houses and be approved by the President, and in such event it is not likely to work any very great amount of mischief. The commission can do little more than investigate, call attention to existing evils, and advise the remedies that should be applied.

#### SUSPENSION CAR TRUCK-A CORRECTION.

In the second paragraph of the illustrated article in our last issue descriptive of "A Suspension Car Truck," an error occurred which conveyed a wrong idea in regard to the leading object or purpose of the construction, and made it to some extent un intelligible. The following is the paragraph entire as it should have been printed:

as it should have been printed:

"First, to receive all lateral motion or shock from
any inequalities of the track singly on each pair
of wheels with their axles and boxes, without
transmitting such motion or shock to the truck
frame; or, in other words, instead of multiplying
the distance of this lateral movement of the wheels
and axles by interposing lateral springs or swinglinks between the truck and car body (heretofore
so necessary to diminish or case the shock), this
shock is taken up and exhausted at the contact of
rail and wheel, thus doing away with the necessity of a swing-bolster."

We would also state that the truck, as shown,

We would also state that the truck, as shown, is designed for freight service exclusively.

#### RAILROAD OPERATING EXPENSES

The extraordinary advance in the prices of iron and steel manufacture within the past year begins to tell heavily in the matter of railroad operating expenses. The ratio of these expenses to earnings has hitherto been forced by the most rigid economy to correspond with the excessively traffic rates that have ruled for a long time. it is evident that these relative expenses can no longer be maintained upon the basis of the same amount of traffic and the same general average of There must either be a largely increased traffic or an increase of rates, or else a falling off They prefer to listen, if they listen at all, to outin net earnings. No amount of skill on the part siders. It has been discovered that to ventilate of managers can avoid this result, and the public may as well begin to realize the fact that cheap of every individual passenger is an impossibility. jointed details are brought under general systems freights will be gauged in future according to a This is now pretty well understood by car-builders, of management, the less there will be of wasteful different scale. A few months have changed the and they are quite likely to rest content with the expenditure caused by frequent changes of officers, relations between railroad expenses and earnings usual side, top and end ventilators, as the simplest, incompetent subordinates, and the endless diversamazingly. The estimates for rolling stock, rails cheapest and most effective way of preventing the and material, at prices current a short time ago, accumulation of bad air in cars. And this is really of so much complaint. Many a dilapidated, pov-

turn to pay more than double the prices they declined to pay a year ago. And then, behind all much imagination has to do in exciting the fears of this is the problem of wages which begins to loom nervous people about breathing impure air, but the up. the increased cost of the necessaries of life. movement is already in progress, and although not Adams, of the Boston & Albany. It has also been booms," it is bound to keep on until wages are tions of value. upon the basis of higher figures, is the enormous even years of depression. lated by state interference

#### A WORD ABOUT CAR VENTILATION.

If the half that is said by learned profess rs and others, about the horrors of badly ventilated cars is true, the risk of injury and sudden death from the general run of railroad accidents is a small matter compared with the risk incurred by breathing the deadly elements in the atmosphere a considerable number of fussy, nervous and faneffluvia that undermine their health, fill their veins with blue blood and plant the germs of ineradicable disease in their systems. These people are, it is true, not very numerous as compared with the bitter complaints to the newspapers, and wonder why patent ventilators are not used that will keep the air in the cars pure and sweet all the time and under all circumstances, no matter whether the lee side of a dozen bone-boiling and hogslaughtering establishments. This kind of talk became so clamorous a few years ago that the carbuilders became a little worked up on the subject, and thought something must be done. deal with the problem intelligently, the libraries atmospherical conditions, the nature of gases, chemical affinities, germs of disease, morbific exhalations, the number of cubic feet of fresh air a person needs per minute, and so forth. Circulars were sent out asking for information, cars were filled with chemical fumes to show the direction of the currents, elaborate reports were made by comannual and monthly meetings of the Association, until interest in the subject gradually died out from utter weariness and exhaustion. Indeed, it is now no easy matter to get any of the old members to "unlimber" on the subject of ventilation.

Many incidents have been related to show how The pay of employes must be increased with following is perhaps as good as any. It was told The at the recent car-builders monthly meeting, by Mr. so decided in its character as some of the other told at some of the annual meetings, but will bear "A man with a mania for fresh air was repetition: scaled up so as to be in line with the general rela- lodging in a room to which he was not accustomed, The only favorable circumstance and awaking in the night with a feeling of op in view of the impending reconstruction of rates pression, he imagined it was owing to a lack of ventilation. He got up to raise the window, and volume of freight traffic, and the probability that as the room was very dark, he groped around till it will keep on increasing in the same or perhaps a he got his hands on a sash with glass in it, which still greater ratio than it has during the past six or he tried to raise, but with all his efforts it remained This traffic is a sure immovable. In his desperation, he broke out one thing, and if railroad interests suffer from increased of the panes, determined to have some fresh air operating expenses, it will only be due to a ruinous tariff of rates induced by competition or regusoundly until morning, when he awoke, and, upon looking around discovered that instead of breaking the window, he had merely broken a pane of glass in a book-case on the opposite side of the room!"

#### RAILROAD CONSOLIDATIONS.

Consolidations, leasings and close alliances, are just now the conspicuous features of railroad progress in this country. Aside from the schemes that of an overcrowded car. As almost the entire population travel in cars more or less, there is of course from all quarters of negotiations looking to a union of railroad interests under one management that atical people who are frightened at these represen- have hitherto been separate and even hostile. Taking tations, and really believe that with every breath a broad view of the vast system, its wonderful de they draw while they are on a train in the winter season, they are inhaling noxious gases and animal traffic, and the numerous competing points both inland and coastwise, for the distribution and shipment of products, the tendency to consolidate into geographical currents and arteries is natural and unavoidable. It is a movement which, it may be great mass who are indifferent about what kind of said, has just begun, and will become more general air they breathe so long as they feel comfortable; as time advances. All the conditions of railway but they think, and talk and worry about it, write prosperity demand it, nor is it likely to work any injury to owners, shippers, employés, the traveling public, or the country at large. The fears that such a movement, if allowed to take its natural course, will subject the great business interests of the train passes through malarial swamps, or along the country to the absolute control of a few individuals who figure as railway "magnates," will turn out to be unfounded. The recent virtual con-solidation of the lines from St. Louis to the South Atlantic and Gulf ports is very significant, not only in itself, but as the forerunner of other combinations looking to a great prospective increase in the were ransacked for technical authorities about trade of southern ports, by a diversion of western atmospherical conditions, the nature of gases, traffic from the leading trunk lines of the north, However powerful these great consolidated interests may turn out to be as the mere controllers of capital, they can never permanently subvert the laws of trade or override a unanimous public sentiment. Being the creatures of law they can never become its creators, except indirectly, nor even mittees, and the discussions were kept up at the then so long as we have a government worth preserving.

From the present outlook, there are likely to be great changes within the next ten years in the arterial systems of our roads. The multitude of little veins which now make up the dense and intricate network, will coalesce more and more, and run together in obedience to a law of mutual atcars so as to satisfy the whims and susceptibilities traction and interest, and the more these dis-

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erty-stricken road, unable of itself to earn its ex- in this country. The products of three of them

tain emergencies, and where an evil is of such an fire-test. aggravated nature that it can not, in the absence of legal restraint, be rooted out in any other way As a rule, however, such lists are not popular, and when resorted to should be very judiciously used in order to avoid doing injustice to parties who have no opportunity afforded them to be heard in their own defense, According to current report, the Central Association of General Ticket and Pas-senger Agents is doing a very effective work, by the use of this means, in preventing the issue of free passes upon false representations, as well as improper use of such as are obtained legiti-ly. But if we are not misinformed, injustice licity, when an explanation of the circumstances would have prevented it.

#### Car-Builders' Monthly Meeting.

The monthly meeting for February was held at the Association Rooms on the 19th ult., the topics for discussion being the old and familiar ones of car ventilation, lighting and heating. The attendance was very good, and among those present were several representatives of the car departments of prominent roads. The difficulties in the way of ventilating passenger-cars in a satisfactory manner were dwelt upon, and also the much-belabored problem as to the precise quantity of fresh air required by each person per minute. It was contended by one of the speakers that ten cubic feet was little enough, and that consequently this amount for each occupant must be taken in, and a like quantity taken out of a car every min and in such a way as not to annoy any one. How to do this however was the thing to be determined. Another speaker could not understand how ten cubic feet of air could be got into a person's lungs and out of them in a minute. He thought two cubic feet a minute would be good and suf-ficient ventilation, and that the ventilation of a car should be independent of the heating. nature of carbonic acid gas was also discussed incidentally-whether it had an odor, how much of it was required to destroy life, whether it went down to the floor or up toward the roof, or whether it became diffused and its noxious proper ties in that way destroyed.

The matter of refrigerator-car ventilation was next taken up, and the testimony of those present, who had given special attention to the subject, was to the effect that moisture was the most prolific cause of decay, both as respects meats and vegetables, because it generated the impure gases. In the case of vegetables, moisture caused fermenta tion, and must be got rid of. A low temperature was not so essential as dry air. Less ice was re-quired for fruits than for meats; but in reference to the latter, only about one-tenth of the space in an ordinary refrigerator car could be spared for ice, which was not a sufficient quantity to create a current of air, hence artificial means had to be employed. The outside air should not come in contact with the ice, but the air in the car should be kept in motion by a fan, so as to bring it in contact with the ice, which was a powerful disin fectant, and destroyed the impure gases.

In reference to the lighting of passenger cars, an inquiry was made whether all 300° fire-test oils were equally safe. It was replied, that so far as the test was concerned, they were all equally safe, no matter who manufactured them; but their illuminating qualities differed very much, according to the processes of manufacture. There were at present five different makers of oils of this test ability, costive habits and all comic diseases.

henses, will by absorption be lifted out of the lough and made productive.

were about the same as to the light produced. It was not necessary that oils of different gravities should be combined in the same proportions and by BLACK LISTS" are perhaps well enough in cer- the same processes, in order to stand the same electric machine attached, and any electric light

#### THE FATAL CAR

They cast it, therefore, in the ditch.
And left it there to rot away, Bout ten miles from the nearest switch. A thing of horror in its day genuine devil-trap it was Which did not work by earthly laws

But where the trickery lay concealed, Or how the hell-constructed plan. So far has never been revealed, And may not ever be to man Whoever took a certain seat, A sudden death was sure to meet

The last place to the right but one,
Just as the train went East or West;
And there that night (the car's first run) A brakeman took a moment's rest:
On brakes! On brakes!! the signal said
His lamp went out, and he was dead.

The Car Inspector sat there next
To feel how ran the springs;
"They don't go easy," said he, vexed.
"They make such rigid things."
Just then Conductor Smith passed by— But not in time to see him die

e priest who came with plous care To gently close the dead man's eyes. And murmur o'er his form a prayer That he might live beyond the skies Before his prayer was said almost, The Holy man gave up the ghost

And as it happened day by day And as it happened day by day, Fresh comers took that ghastly place; And those who came were doomed to stay, In Death's insidious embrace; Such numbers of the people died, There were not many left to ride

Then persons who had given thought To note the thing, which some had not eclared that all the evil wrought Had happened in that only spot, And even those who scoffed thereat Would sit in any seat but that,

VIII The President sat there at last To lift the superstitious load Which heavier grew and threatened fast To crush the fortunes of his road: " Mere Apoplexy; pshaw!" he said, And in a moment he was dead!

Still others tried it, and they shared The common fate, excepting one, And he who sat there and was spared Was looked with awe and fear upon. He helped to build the car—Black Dan A Fiend he seemed like-not a mar

They cast it, therefore, in the ditch, And left it there to rot away, Bout ten miles from the nearest switch A thing of horror in its day; A genuine devil-trap it was, Which did not work by earthly laws JOSEPH TAYLOR

THE locomotive electric light, recently intromay be used. When the engine is moving along the line, the electric machine rotates at its proper speed, and when it is necessary to stop in order that the light may be directed on some particular spot, the driving wheels are thrown out of gear by means of the disengaging handle attached to the pinion on the crank shaft, and the machine ceases to be a locomotive, while the engine continues to move the dynamo-machine at its proper velocity. The engine is furnished with sensitive governors, so that the speed of the dynamo-machine may be accurately regulated, this being very important in order to insure a bright and continuous light.

MR. CHARLES LINDBLOM, the inventor of the Flexible Wheel Base Car, illustrated in this issue, desires a position on a railroad. He has had large experience on South American roads, and is an in-genious and capable mechanic. He may be ad-dressed at the office of the CAR-BUILDER.

#### Our Directorn.

We note the following changes since our last issue. Readers are requested to give us prompt notice of changes when they occur.

Alabama Great Southern.—Mr. John Scott has been appointed Assistant General Manager, and R. W. Hea-ley, Purchasing Agent.

Bedford, Springville, Owensboro & Bloomfield.—Mr.
J. W. Kennedy has been appointed Superintendent, in place of E. Hulbert, who has gone to Texas. Mr. Ken-nedy was recently Road Master of the Jeffersonville, Madison & Indianapolis.

Burlington & Lamoille.—We are informed that the appointment of N. H. Leach as Superintendent, rice D. C. Linsley, as announced in our last issue, is erroneous. Mr. Linsley is the General Manager, which position he has held for a considerable time.

Cumberland & Pennsylvania,—The position of Mas-ter Mechanic, heretofore filled by Mr. J. F. Van Horne, has been abolished.

Fort Wayne & Jackson.—Mr. M. D. Woodford has been appointed General Superintendent of this road— formerly Fort Wayne, Jackson & Saginaw.

Houston, East & West Texas.—Mr. E. Hulbert, late of the Bedford, Springville, Owensboro & Bloomfield road, has been appointed General Superintendent.

Ritnois Midland.—Mr. H. H. Osborn has been ap-pointed master mechanic, vice J. G. Ciliford. Mr. Os-born was for some years master mechanic of the Paducah & Memphis.

Jacksonville, Pensacola & Mobile,—Mr. Jas. D. Hollis-ter has been appointed Master Mechanic and Master Car Bullder, eice John P. Laird, resigned. Missouri Puzific.—Mr. A. W. Dickinson. heretofore Ass't Superintendent of Union Bailway & Transit Co., has been appointed Ass't General Superintendent of this road.

New York, Ontario & Western,—This is the name of the New York & Oswego Midland under its new organ-ization. Mr. Theodore Houston has been chosen Gen-eral Manager. Mr. A. H. Danforth is Acting Super-intendent of the Southern Division, eice T. C. Purdy,

Richmond of Petersbury.—Mr. Theo. D. Kline has been appointed Superintendent, vice A. Shaw, Mr. Kline was previously Superintendent of the Charlotte, Colum-bia & Augusta.

St. Louis & Southeastern.—This road is now known the St. Louis Division of the Nashville, Chattanooga St. Louis. E. Culverhouse is Division Superintend-

Texas & Pucific.—Mr. J. S. Noble, Superintendent of the Transcontinental Division, has been placed in charge of the Jefferson Division also, in place of E. Marsh. Mr. C. Harris has been appointed Superintendent of the Southern Division.

Toledo & Ann Arbor and Detroit, Hillsdate & South-western,—Mr. J. W. Smith, of Detroit, has been ap-pointed General Manager of these roads. He has here-tofore been General Manager of the Eric & North Shore

Toledo, Peoria & Western.—This company is the suc-

#### RICHARD DUDGEON,



Boiler-Tube

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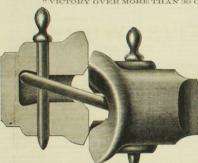
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	Indiana, Bloomington & Wester	ern . C. A. Thomps	on H. Ford	Mattoon, Ill.	Northern Central	Lewis James	Bay Ridge, L. L.
	Intercolonial & Great Norther	Th. John G. Conlo	on W. H. Martin.	Palestine, Tex.	Northern Central	J. M. Coale	Baltimore, Md.
	Iron	Perry Scott	A. J. Sanborn ion. H. Ford on. [W. H. Martin y. Edw. Shaffer Clem. Roetling	Urbana, III. Palestine, Tex. Moncton, N. B. Ironton, O.	Northern New Hampshire	James Strode. J. C. Dyott  **Jas. N. Lauder Peter Clark Peter Clark A. P. Farrar A. P. Farrar	Concord N. Y.
		J			Northern Pacific	Peter Clark Peter Clark A. P. Farrar A. P. Farrar W. H. Day	Concord, N. H. Toronto, Can. Brainerd, Minn. Florence, S. C. Saucelito, Cal. cott. Battle Creek, Mich.
	Jacksonville, Pensacola & Mobi Jeffersonville, Mad. & Indianap Jacksonville, N. West. & S. Ea Joplin. Junction & Breakwater	ile John P. Laird		Tallahassoo Flo	North Pagific Coast	W. H. Day	Florence, S. C.
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	Junction & Breakwater	P. T. Butterly.	P. T. Butterly	Tallahassee, Fla Jeffersonville, In Jacksonville, Ill Girard, Kan Lewes, Del			Dattie Creek, Mich.
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	Kansas City, Ft. Scott & Gulf. Kansas City, Fort Scott & Gulf. Kansas City, Lawrence & South Kansas City, Lawrence & South Kansas Coentral. Kansas Pacific. Kansas Coentral.	W. D. Rowley		St. Joseph, Mo. Kansas City, Mo. Kansas City, Mo. Lindependence, My. St. Joseph, Mo. Leavenworth, Ka. Armstrong, Kan. Armstrong, Kan. Denver, Col. To. Covington, Ky. Bath, Me.	Ohio & Mississippi	‡J. F. SechlerJ. P. Coulter.	
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	Kan. City, St. Jo. & Coun. Bluff Kansas Central	Wm. D. Rowle	m. J. H. Burnham. y. Theo. Aylesbur	ySt. Joseph, Mo.	B. C. F. & N. Bedford Di	J. K. Taylor A. Gleason	Boston, Mass. Pns. Taunton, Mass. Portland, Oregon. Dalles, Oregon.
	Kansas Pacific	** John MacKer	nzie, T. B. Roberts	Armstrong Kan	n. Oregon & California.	§§J. Brandt	Portland, Oregon
	Smoky Hill Division	John Backer James Long John B. Daily R. McDougal J. R. Ledyard E. Bolton		Armstrong, Kan.	oregon Steam Navigation Co.	P	Dalles, Oregon.
	Denver Division Kentucky Central	R. McDougal.	J. L. Hackathor C. L. Turner	Denver, Col.	Paducah & Elizabethtown	P	
	Kentucky Central Knox & Lincoln	E. Bolton	J. L. Hackathor	nCovington, Ky.	Paducah & Elizabethtown Painesville & Youngstown	W. D. Robb W. D. Robb J. H. Jones.	Elizabethtown, Ky.
		Υ.			Panama Parker & Karns City Pensacola	Philip Davies Wm. Wolford	Aspinwall, U. S. C.
	Lake Erie & Western Lake Ontario Southern. Lake Shore & Michigan Souther Michigan Southern Divisio	E. Clemons		Framont Ohio	Farker & Karns City Pensacola Pensacola & Selma Pensayivania Pennsyivania Pennsyivania Pennsyivania Pennsyivania	R. G. Nichol	Pensacola, Fla.
	Lake Shore & Michigan Souther	Geo. Thompso	nWm. Currier yttJohn Kirby	Sodus Point, N. Y	Pennsylvania.	§§T. N. Ely	Selma, Ala.
	Michigan Southern Divisio	n. Geo. W. Steven	STJohn Kirby	Cleveland, Ohio.	Pennsylvania	H. D. Garrett. J. W. Van Hou E. L. Caum. Samuel W. My G. W. Strattan. John P. Levan D. O. Shaver. J. G. Stewart. L. A. Bosdevex. E. F. Bosdever	ten W.Philadelphia,Pa
	Toledo Division	J. M. Sanborn	Frank O. Bray	Adrian, Mich.	Pennsylvania	G. W. Strattan John P. Levan	ersHarrisburg, Pa.
	Erie Division.	J. M. Sanborn. L. O. Gassett. Edward Studle. John I. Kinsey P. Hofecker. John Campbell D. Clark. A. Mitchell	W. O. Smith J. Withyecombe y. A. C. Robson	Cleveland, Ohio.	Pennsylvania. Pennsylvania. New Jersey Division. West Jersey Division. Peoria, Decatur & Fransylle. Peoria, Decatur & Fransylle. Peoria & Springfield. Petersburg.	D. O. Shaver J. G. Stewart L. A. Bosdevey E. F. Bosdevey	Pittsburg, Pa.
	Lehigh Valley	John I. Kinsey	yA. C. Robson	Buffalo, N. Y.	New Jersey Division	David H. Bake	rJersey City, N. J.
	Lehigh Valley	P. Hofecker.		Weatherly, Pa.	New Jersey Division	Tho. Kerr P. S. Bogart	So Amboy N. J.
	Lehigh Valley	D. Clark		Delano, Pa. Hazleton, Pa	New Jersey Division	R. McDowell	Lambertville, N. J.
	Lehigh Valley	A. Mitchell	E P Prown	Waverly, Pa.	West Penn, Division	C. B. Street M. H. Fails	Blairsville, Pa.
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	Nashville & Decatur Div.	W. J. Steele	J. P. Furguson .	Nashville, Tenn.	Think to have the control of the con	W. L. Forster	Renovo, Pa.
	Memphis & Ohio Div	Thos. Walsh		Birmingham, Ala	Philadelphia & Baltimore Centra	W. T. Smith	Erie, Pa.
	Ev., Hen. & Nashville Div	Wm. Adair E. M. Humstone		Bowling Green, Ky	Philadelphia & Reading	I.S. D. Danfield S. D. Danfield *L. B. Paxson John H. Ranki W. H. Ellis C. D. Ellis	nReading, Pa.
		M		Nashville, Tenn.	Germantown & Norris'n Di	v Jackson Richards	Catawissa, Pa.
	Macon & Brunswick	R Wagnon			North Penn. Division	Chas. Norton C. W. Hammar	in Philadelphia, Pa.
	Maine Central	R. Wagnon J. W. Philbrick	R. Wagnon. J. W. Philbrick. C. H. Kenison J. T. Gordon	Waterville, Me.	Piedmont Air Line	.‡R. D. Wade	Richford, Vt.
	Manchester & Lawrence	.J. T. Gordon	C. H. Kenison	Augusta, Me.	North Carolina Div	J. B. Vaughan J. C. Holt	Richmond, Va.
	Macon & Brunswick Maine Central Manchester & Lawrence. Manchester & Lawrence. Manchester & Cleveland. Marcheta Pittaburg & Cleveland. Marietta & Cincinnati Marquette. Houghton & Onton'gr Memphis & Little Rock Them. Memphis & Little Rock Them. Memphis & Little Rock Them. Michigan Central. Michigan Central. Milwaukee, Lake Shore & West'n Minreapolis & St. Louis Missouri & Western Missouri & Tennessee Missouri & Grander & Missouri & Western Missouri & Western Missouri, Iowa & Nebraka Missouri, Kansas & Texas	J. T. Gordon Allan Stirling Thos. Robertson E. M. Bosley M. W. H. Williams G. M. Taylor Tho. Rennell §H. N. Burford S. H. Edgerly		New York, N. Y.	Pittsburg, Cincinnati & St. Louis	§§G. W. Rhodes	Williamsport, Pa. Sunbory, Pa. Renovo, Pa. Renovo, Pa. Renovo, Pa. Renovo, Pa. Renovo, Pa. Renovo, Pa. Catawissa, Pa. Catawissa, Pa. Dilladelphia, Pa. Dilladelphia, Pa. Richmond, Va. Richmond, Va. Richmond, Va. Comp. Shops, N. Columbus, O. Columbus, O. Locausport, Ind.
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	Marquette, Houghton & Onton'gr Memphis, Paducah & Northern	G. M. Taylor	H. D. Lyons	Marquette, Mich.	Col., Cin. & Ind. Division	Robert Curtis Tho. Chamberl	in Columbus, O.
	Memphis & Little Rock	Tho. Rennell	P. Twitchell	Argenta, Ark.	Col. Cin. & Ind. Division	C. M. St. Clair	Indianapolis, Ind.
	Michigan Central	S. H. Edgerly	J. J. Kasey	Memphis, Tenn.	Pitts, Cin, & St. Louis Division.	Leroy Kells  Daniel Jewell.	In. Columbus, O. Locarspoort, Ind. Locarspoort, Ind. Indianapolis, Ind. Indianapolis, Ind. Denison, O. Selubervill, O. Seluber
	Milwaukee, Lake Shore & West'n	S Charnly		Detroit, Mich.	Pitts, Cin. & St. Douis Divis's	n. Ross Kells  1. A. K. Mansfield  9. Geo. Parkin. John Marquis  J. J. Book Israel Lee  J. J. Kirkland  H. J. Bookhammer John Monks	Steubenvill, O.
	Minneapolis & St. Louis	.Tho. Downing	Tho. Downing Robert Hay S. J. Bolton John C. Barbour John Hodge	Manitowoc, Wis. Minneapolis, Minn.	Pittsburg, Fort Wayne & Chicago	J. M. Boon Israel Lee	Fort Wayne, Ind.
	Mineral Range		Robert Hay	Mineral Pt., Wis.	Pittsburg, Titusville & Buffalo	H.J. Bookhammer John Monks	Crestline, O.
	Mississippi & Tennessee	Geo. Haszinger.	S. J. Bolton	Memphis, Tenn.	Pittsburg, Virginia & Charleston.	Wm Lininger	Pittsburg, Pa.
	Missouri, Iowa & Nebraska	J. G. Crozier		Alexandria. Mo.	Portland & Ogdensburg	Geo. H. Poor W. G. Brewer H. C. Tompson . David Dow	Pittsburg, Pa.
	Missouri, Kansas & Texas Missouri, Kansas & Texas	.H. H. Alexander	John C Barbour	Dennison, Texas.	Port Dover & Lake Huron	H. C. TompsonDavid Dow	Portland, Me.
	Missouri Racific	.Wm. T. Small	The state of the s	Parsons, Kan.	Port Royal & Augusta	Geo. Riley J. H. Milton	Port Royal, S. C.
	Missouri Pacific		John Hodge	St. Louis, Mo.	Prince Edward Island	A. Stronach [D. M. Fraser	Poughkeepsie, N. Y
	Missouri Pacific	Geo. W. Walshe		Sedalia, Mo.	Providence & Springfield	G. T. Richardson	Pascoag, R. I.
	Mobile & Montgomery	Geo. W. Walshe H. V. Faries W. H. Thomas	Lewis Barham	Montgomery, Ala.	Providence, Warren & Bristol	A. Griggs A. Griggs Rufus Smith J. Brightman	Bristol, R. I.
	Mobile & Ohio	.R. H. Briggs	. Lewis Barham . A. J. Nix . J. T. Booth	Columbus, Ga.	Philadelphia & Erie.  Philadelphia & Baltimor Centra Philadelphia & Raading Genetics Branch Control of the Philadelphia & Reading Genetics Branch Control of the Philadelphia & Reading Genetics Branch Control of the Philadelphia Control of the Philadelphi	Q	
	Missouri, Kansas & Texas Missouri Pacific Missouri Pacific Missouri Pacific Missouri Pacific Missouri Pacific Missouri Pacific Mobile & Gontgomery Mobile & Grardi Mobile & Girardi Mobile & Girardi Mobile & Girardi Mobile & Ohio Mobile & Ohio Mobile & Ohio Mobile & Ohio Motigomery & Eufaula Mortgomery & Eufaula Mortgomery & Eufaula Mortgomery & Eufaula Mortgomery & Eufaula	W. H. Thomas. J. C. Albrecht. R. H. Briggs. John Fitzgerald. M. T. Carson. D. M. Gugel. N. Tilton.		Macon, Ga Waterville, Me. Augusta, Me. Augusta, Me. Augusta, Me. New York, N. Y. Manieta, Ohio. Marquette, Mich. Padinah, K. Y. Manieta, Mich. Marquette, Mich. Padinah, K. Y. Manieta, Mich. Marquette, Mich. Marquette, Mich. Manitowoc, Wis. Minasapolis, Minn. Manitowoc, Wis. Minasapolis, Minn. Manitowoc, Wis. Minasapolis, Tenn. Manitowoc, Wis. Minasapolis, Minn. Manitowoc, Wis. Minn. Macon, Wiss. Macon, Usa.	Quebec, Mont., Ottawa & Occidenta Quincy, Missouri & Pacific	ItA. Davis	Montreal, Can, Kirksville, Me.
	Morgan's Louisiana & Ton	D. M. Gugel	James A. Knight Wm. O'Brien	Macon, Ga.			Karksville, Me.
	s Louisiana & Texas	.s. Illion	wm. O'Brien	Algiers, La.	Raleigh & Augusta Air-Line Raleigh & Gaston Rhinebeck & Connecticut Rich., Fredericksburg & Potomac Richmond & Daaville Richmond & Petersburg Rich., York River & Chesapeake Rio Grande	R **B. R. Harding **B. R. Harding A. W. Quackenbush John H. Decker H. Khun W. H. Trainhan See Picdmont Air-Line	Raleigh, N. C.
	Nashua & Lowell Nashule, Chattan'ga & St. Louis NS. Louis Division. NS. Louis Division. Nebraska Newbraska	S A De	0.1.0		Rhinebeck & Connecticut	A.W. Ouackenbush John H. D.	Raleigh, N. C. Raleigh, N. C. Rondout, N. Y.
	Nashville, Chattan'ga & St. Louis	James Cullen	.S. A. Davis. .J. G. Sawyer. .W. H. H. Price George W. Gray.	Nashua, N. H.	Rich., Fredericksburg & Potomac	H. Khun W. H. Trainhan	n Richmond, Va.
	St. Louis Division	L. B. Salisbury	W. H. H. Price	Mt. Vernon, III.	Richmond & Petersburg	John O'Brien H. L. Carter	Richmond, Va.
1	Nebraska	D. Hawksworth.	George w. Gray	Bridgeport, Ct.	Rich., York River & Chesapeake.	A. B. Armstrong . A. B. Armstrong	Richmond, Va.
1	New Brunswick	P. A. Logan	P. A. Logan	Dutchess J'n, N. Y.	Rochester & State Line	A. J. Robbins	Rochester, N. Y.
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3	New Jersey & New York	J. S. Drake		Manchester N. J.	Pandana Walland S. O. A.	S	
1	sew Orleans & Mobile	Josiah Bettis		Mobile, Ala.	San Francisco & Northern Pacific.	Ed Reynolds H C Whiting	St. Louis, Mich.
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2	ew York, Lake Erie & Western	George H. Griggs.	wilder	Hornellsville, N. Y.	Scioto Valley Seaboard & Roanoke	John Story John Story	Portsmouth, O.
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D	New York Lake Frie & Western  Lew York Central & Hud. River  Lew York Central Division  New York Central Division  New York Central Division  New York Central Division  Lew York Central Divisi	Edw. Minshull		West Albany, N.Y. Syracuse, N.Y. E. Buffalo, N. Y. Niagara Falls, N.Y. New York, N.Y. E. Rochester, N.Y. Rochester, N.Y. Middletown, N.Y.	Shenango & Allegheny Shepang, Sloux City & Dakota Sloux City & Pacific Shoux City & Pacific Shoux City & Pacific Southern Pacific Northern Division Los Angeles & Yuma Div Tulare Division Southern Central Southern Central Southern Central Southern Central South Facilic Coast.	W. B. Smith Geo. H. Gramling Chas. G. Brown H. Mooney J. B. Henney J. B. Henney Martin Carter Martin Carter	Auburn, N. Y. Hokah, Minn Newark, Cal.

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Raitroad.	F Durkee	Furchasing Agent.	Saratora N V	Central
labama Central J	ohn M. Bridges.		Selma Ala.	Ce
Jahama Great Southern	has, P. Ball	R. W. Healey	Chattanooga, Tenn.	Le
Ibany & Susquehanna	C. F. Young		Honesdale, Pa.	Charlot
lleghany Valley D	David McCargo	John L. Awl	Pittsburg, Pa.	Charlot
nderson, Lebanon & St Louis J	as. A. Larnerd		Anderson, Ind.	Chepau
rkansas Midland	A. H. Johnson .		Ashtabula O	Chesape
Shtabula & Fittsburg	W R Strong	F M Smith	Topeka Kan	Cherok
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Eastern Division	). J. Chase		.Topeka, Kan.	Chester
tchison & Nebraska L	W. Towne		Atchison, Kan.	Chicago
tchison & Nebraska*	G. H. Nettleton	.G. W. P. Atkinson.	.Kansas City, Mo.	Chicago
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Third and Fourth Divisions ?	r. A. Phillips		Galion, O.	Chicago
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Atlantic, Tennessee & OhioJ	J. Gormley		Charlotte, N. C.	5
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Raltimore & Ohio	**W. M. Clement	s.N. S. Hill.	. Baltimore, Md.	Chicago
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Bell's Gap	Robert G. Ford		. Bellwood, Pa.	( hicag
Bennington & Rutland	F. C. White	F. C. White	.Rutland, Vt.	Chicag
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Cayuga & Susquehanna	W. R. Humphre	V8	Ithaca, N. Y.	Cincin
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Vilmington & Welden Visconsin Central Vorcester & Nashua	G. Campbell	G Campbell
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Thereless Division	Frank Fran	
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Control Division	W W Stearns	
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Length & Susq. Division	A H Wood	
nampaign, Havana & Western	Two C Clauke	
Charlotte, Columbia & Augusta	C II Diess	C II Platt
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.Chicago, III.
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Erie & Pittsburg *J. D. Laying Wm. Mullins	Palisade Nev	Ligonier Valley	Thos. A. Mellon	Little Rock - rk
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Eastern Kentucky Grand States Company	Orbisonia, Pa. Opelika, Ala. Jefferson, Tex. Knoxville, Tenn. Boston, Mass. Riverton, Ky. Riverton, Ky. Prince Anne, Md. Erie, Pa. Pittsburg, Pa. Bangor, Maine. Evansvill, Ind. Terra Haute, Ind.	Los Angeles & Independence	T R Sharp Rec R M Galloway	Los Angeles, Cal.
East Tenn. Virginia & Georgia. Eastern Kennoly, Eastern Kennoly, Eastern Kennoly, Geo. Noble Eastern Shore. W. Thompson. Eric & Pittsburg. Earle & Pittsburg. European & W. Thompson. Eric & Pittsburg. European & W. Thompson. European & W. Thompson. European & W. Thompson. European & Fallssol. European & Terra Haute Evansville, Terra Haute & Chi.  Jos. Collett. W. D. Macfarland. Evansville, Terra Haute & Chi.	Terra Tiadie, Ilid.	Louisville & Nashville	*F. de Funiak	. Louisville, Ky.
The Idense W.C. Donte		Louisville & Nashville	D.W. C. Rowland, G. C. Breed	. Louisville, Ky.
				. Bowling Green, Kv.
Vermont & Mass. Div ‡E. K. Turner	Fitchburg, Mass.	Nashville & Decatur Div	James Geddes	Nashville, Tenn.
Fitchburg John Adams F. Fratter Vermont & Mass. Div E. K. Turner Flint & Pere Marquette Sanford Keeler G. G. Cook Fluids Control W. M. Davidson W. M. Davidson	Boston, Mass. Fitchburg, Mass. E Saginaw, Mich. Jacksonville, Fla.	Memphis Line Nashville & Decatur Div. So. & North Ala. Division Louisville, Cincinnati & Lexington.	James Geddes B. Dunham Wm. Mahl Wm. Mahl	. Nashville, Tenn. . Birmingham, Ala. . Louisville, Ky.
Fitchburg John Adams F. S. Fratt Vermont & Mass. Div. † E. K. Turner Flint & Pere Marquette Sanford Keeler G. G. Cook Florida Central . W. M. Davidson . W. M. Davidson . Flushing, North Shore & Central Samuel Spencer . Samuel Spencer	Boston, Mass. Fitchburg, Mass. E Saginaw, Mich. Jacksonville, Fla. L'g Isl'd C'y, N. Y.	Memphis Line Nashville & Decatur Div. So. & North Ala. Division. Louisville, Cincinnati & Lexington. Louisville, New Albany & Chicago	James Geddes B. Dunham Wm. Mahl Wm. Mahl S. M. Brown Wm. M. Lewis F. Nawland Press	Bowling Green, Ky Nashville, Tenn Birmingham, Ala Louisville, Ky New Albany, Ind New Albany, Ind.
Fitchburg John Andrus J. S. France F. G. G. Cook F. Torida Central Statue B. Senore F. G. G. Cook F. Torida Central Statue B. Senore F. Samuel Spencer Fonda, Johnston A. Gloversville L. Caten F. Samuel Spencer F. S. S. Kinyon, M. S. Kinyon, S. S. Kinyon, S. S. Kinyon, S.	Boston, Mass. Fitchburg, Mass. E Saginaw, Mich. Jacksonville, Fla. L'g Isl'd C'y, N. Y. Gloversville, N. Y. Fond du Lac, Wis.	Memphis Line Nashville & Decatur Div. So. & North Ala, Division Louisville, Cheinnati & Lexington, Louisville, New Albany & Chicago Louisville, N. Albany & St. Louis	James Geddes B. Dunham Wm. Mahl S. M. Brown Fes E. Newland, Pres	Wilkesbarre, Pa. Quebec, Can. East Liberty, Pa. Little Rock, *rk. Pine Bluff, Ark. Los Angeles, Cal. L'g Isla'd C'y,N.Y. Louisville, Ky. Louisville, Ky. Bowling Green, Ky. Nashville, Tenn. Birmingham, Ala. Louisville, Ky. Nashville, Tenn.
Fitchburgsont & Mass. Div. John Admin. Filing & Free Marquette Sanford Keeler. G. G. Cook. Florida Central Flushing, Forth Shore & Central Samuel Spencer. Samuel Spencer Foods, Johnston & Peoris. A. Kluyon, Fort Madison & Northwestern S, B. Kenrick. S. B. Kenrick	Boston, Mass. Fitchburg, Mass. E Saginaw, Mich. Jacksonville, Fla. L'g Isl'd C'y, N. Y. Gloversville, N. Y. Fond du Lac, Wis. Fort Madison, Ia	Michigan Division Detroit Division Detroit Division Lansing Division Franklin Division Franklin Division Mahanoy Division Mahanoy Division Mahanoy Division Mahanoy Division Mahanoy Division Mahanoy Division Levis & Kennebee Ligonier Valley Ligonier Valley Ligonier Valley Ligonier Valley Ligonier Valley Men St. Bushart Little Rock, Miss. River & Texas. Long Risks Line Memphis Line	A. G. Brodhead, Jr. James I Blisklee H. E. Packer A. Mitchell Thou A. Mellon Thou A. Mellon Thou A. Mellon T. Hartman J. A. Woodson J.	. Nashville, Tenn. Birmingham, Ala. Louisville, Ky. New Albany, Ind. New Albany, Ind.
Fitchburg S. A. C.	Hoston, Mass. Fitchburg, Mass. E Saginaw, Mich. Jacksonville, Fla. L'g Isl'd C'y, N. Y. Gloversville, N. Y. Fond du Lac, Wis. Fort Madison, Ia Jackson, Mich. Fort Wayne, Ind.	Memphis Line Nashville & Decatur Div. So, & North Ala, Division Louisville, Cincinnati & Lexington, Louisville, New Albany & Chicago Louisville, N. Albany & St. Louis Macon & Brunswick Maine Central.	James Geddes B. Dunham Wm. Mahl Wm. Mahl S. M. Brown E. Newland, Pres  M Geo. W. Adams W. C. Jones Payson Tucker	Bowing Green, KyNashville, TennBirmingham, AlaLouisville, KyNew Albany, IndNew Albany, IndMacon, GaPortland, Me.
Fitchburgmont & Mass. Div. San Andrews. Fitting & Fore Marquette. Sanford Keeler. G. G. Cook. Florida Central. Bankord Keeler. G. G. Cook. Florida Central. Bankord & Central. W. M. Davidson. W. M. Davidson. Flushing. Nonewa & Gloverwille. L. Cateno. For Madison. Service & Gloverwille. L. Cateno. For Madison. & Northwester. S. B. Kurjon. For Madison. & Northwester. S. B. Kurjon. For Wayne, Muncle & Cinctinnati. W. W. Worthington & P. Ag't. Forburg. St. Peterbaug. & Carlon Benj. B. Newton.	Boston, Mass. Fitchburg, Mass. E Saginaw, Mich. Jacksonville, Fla. L'g Isl'd C'y, N. Y. Gloversville, N. Y. Fond du Lac, Wis. Fort Madison, Ia Jackson, Mich. Fort Wayne, Ind. Foxburg, Pa. Frankfort Ind.	Memphis Line Nashville & Decamp Div. Nashville & Decamp Div. Louise of a Worth Ala Lexington. Louiselle, New Albany & Chicago Louisville, N. Albany & St. Louis Macon & Brunswick Maine Central. Manchester & Kenne	Jan songomery James Geole James Geole Wm Mabl	Bowling Green, Ky. Nashville, Tenn. Birmingham, Ala. Louisville, Ky. New Albany, Ind. New Albany, Ind. Macon, Ga. Portland, Me. Nashua, N. H. Concord, N. H.
Fitchburg.  Fitch Fee Marquett.  Sanford Keeler. G. G. Cook. Florida Central.  Sanford Keeler. G. G. Cook. Florida Central.  Flushing. North Shore & Central Samuel Spencer.  Sanda Johnstown & Gloversville. L. Laten.  Fond is Lac. Alvortheestern. S. B. Kenrick.  For Wayne & Jackson.  M. D. Woodford. H. A. Raymond. Fort Wayne Muncle & Checimant. W. W. Worthington & P. Ag't.  Froxburg. St. Petersburg & Clarion. Benj. B. Newton.  Frankford & Kokomo.  F. B. Elgecombe.	Boston, Mass. E Saginaw, Mich. Jacksonville, Fla. L'g Isl'd C'y, N. Y. Gloversville, N. Y. Fond du Lac, Wis. Fort Madison, Ia Jackson, Mich. Foxt Wayne, Ind. Foxburg, Pa. Frankfort, Ind. Fredericton, N. B.	Memphis albescatur Div. So. & North Ala. Division. Louisville, North Ala. Division. Louisville, North Ala. Division. Louisville, New Albany & Chicago Louisville, N. Albany & St. Louis Macon & Brunswick. Maine Central. Macon & Brunswick. Maine Central. Macon & Marchester & Lawrence. Marchester & Lawrence. Marchester & North Weare.	Jas. anongomery Jas. anongomery B. Dunham Wm. Mahl. Wm. Mahl. S. M. Brown. Wm. M. Lewis E. Newland. Pres. E. Newland. Pres. Jayeon Tucker H. E. Chamberlin. H. E. Chamberlin.	.Bowling Green, Ky. Nashville, Tenn. Birmingham, Ala. Lonisville, Ky. New Albany, Ind. New Albany, Ind. Macon, Ga. Portland, Me. Nashua, N. H. Concord, N. H. Concord, N. H.
Flichburg. John Adams. F. S. Pratt. Vermont & Mass. Div. 12. K. Turner. G. G. Cook. Flint & Pere Marquette. W. M. Davidson, W. M. Davidson, V. G. G. Cook. Floathing, North Shore & Central. Samuel Spencer. Samuel Spencer. Fonda. Johnstown & Gloverswille. L. Caten. Fonda Lockson W. G. Samuel Spencer. Samuel Spencer. Fonda. Johnstown & Gloverswille. L. Caten. Fonda. Johnstown & Gloverswille. L. Caten. Fonda. Johnstown & G. S. B. Kenrick. Fort Wayne & Jackson. M. D. Woodford. H. A. Raymond. Fortward Muncle & Chocimath. W. W. Worthington & P. Ag't. Foxburg & Kokomo. F. B. Edgecombe. Freeloid & New York. J. E. Halph.	Boston, Mass. E Saginaw, Mich. Jacksonville, Fla. L'g Isl'd C'y, N. Y. Gloversville, N. Y. Fond du Lac, Wis. Fort Madison, Ia Jackson, Mich. Fort Wayne, Ind. Foxburg, Pa. Frankfort, Ind. Fredericton, N. B. Freehold, N. J.	Memphis Line Neadwilds & Decatur Pr. Neadwilds & Decatur Pr. Louisville, Cheimatid Existion. Louisville, New Albany & Chicago Louisville, New Albany & Chicago Louisville, New Albany & Chicago Louisville, New Albany & St. Louis  Macon & Brunswick Macon & Brunswick Manchester & Keene. Manchester & Keene. Manchester & Alwerne. Manchester & North Weare Manchester Division. Eastern Division.	Jan anongoments Jan anongoments B Dunham Wm Mahl B Dunham Wm Mahl Wm Mahl Wm Mahl Wm Mahl Wm Mahl Wm Mahl Wm Jung Wm Mahl Wm Jung Wm Mah Wm Jung Wm Ju	.Bowlinz Green, Ky. Nashville, Tenn. Birmingham, Ala. Louisville, Ky. New Albany, IndMacon, GaPortland, MeNasbua, N. HConcord, N. HConcord, N. HNew York, N. YNew York, N. Y.
	Boston, Mass. Fitchburg, Mass. Fitchburg, Mass. E Sagrinaw, Mich. Jacksonville, Fla. Lig Isl'd Cy, N. Y. Gloversville, N. Y. Fond du Lac, Wis. Fort Madison, Ia Jackson, Mich. Forburg, Pa. Jackson, Mich. Forburg, Pa. Frankfort, Ind. Fredericton, N. B. Freehold, N. J.	Memphis Lines, and Pierson So. & North Ma, Division Louisville, Cheimati & Lexington Louisville, Cheimati & Lexington Louisville, New Albany & Chicago Louisville, Na Albany & St. Lawrence, Manchester & Keene, Manchester & North Wears, Manchester & North Wears, Manchester & North Weatern Division, Western Division, Western Division	Jan and Confedence of the Conf	.Bowling Green, Ky. Nashville, Tenn. Birmingham, Ala. Louisville, Ky. New Albany, Ind.  Macon, Ga. Portland, Me. Nashua, N. H. Concord, N. H. Concord, N. H. New York, N. Y. New York, N. Y. New York, N. Y. New York, N. Y.
Tomas Converse	Boston, Mass. E Saginaw, Mich. E Saginaw, Mich. Jacksonville, Fla. Y. Gloversville, Fla. Y. Gloversville, N. Y. Gloversville, N. Y. Fond du Lac, Wis. Fort Madison, Ia Jackson, Mich. Fort Wayne, Ind. Foxburg, Pa. Frankfort, Ind. Fredericton, N. B. Freehold, N. J. Houston, Texas, Palestine, Texas,	Mamphis American Pierro So. & North Ma. Division. Louisville, Cincinnata & Lexington. Louisville, N. Albany & St. Louis- Louisville, N. Albany & St. Louis- Macon & Brunswick Maine Central. Macon & Brunswick Maine Central. Marchester & Koren Manchester & Koren Manchester & North Weare. Manchester & North Weare. Manchester & Division.  Eastern Division. Marietta, Pittsburg & Cleveland. Marietta, Pittsburg & Cleveland.	Anna on the Cory of the Cory o	Bowling Green, By Nashville, Yean, Birmingham, Ale New Albaoy, Ind. New Albaoy, Ind. New Albany, Ind. Nashua, N. H. Concord, N. H. Concord, N. H. New York, N. Y. New York, N. Y. Cincinnati, O. Marietta, O.
Tomas Converse	Boston, Mass. E Saginaw, Mich. E Saginaw, Mich. Jacksonville, Fla. Lig Isl'd C.Y., N. Governer Lee, Wis. Fort Madison, Ia Jackson, Mich. Fort Wayne, Ind. Foxburg, Pa. Frankfort, Ind. Fredericton, N. B. Freehold, N. J. Houston, Texas. Palestine, Texas. Sayre, Pa. Sayre, Pa. Sayre, Pa. Sayre, Pa. Sayre, Pa. Sayre, Pa.	Memphis Amesatur Div. So. & North Ais, Division. Louisville, Chorimati & Lexington. Louisville, Chorimati & Lexington. Louisville, Swa Manny & Chicago Louisville, Swa Manny & St. Louisville, Manny & Swa Manny & Swa Manny & Manny & Levision. Western Division. Western Division. Western Division. Marietta, Pittsburg & Cleveland. Marquetta, Pittsburg & Cleveland.	Jan and Confedence Jan and Confedence Jan and Jan B. Dunham Wm. Mahl. S. M. Brown L. Swelston Jan and	J. Bowling Green, Ry. Nashville, Tenn. Nashville, Tenn. Nashville, Ky. New Albany, Ind. New Albany, Ind. New Albany, Ind. New Albany, Ind. Nashua, N. H. Concord, N. H. Concord, N. H. Concord, N. H. Concord, N. Y. New York, N. Y. New York, N. Y. New York, N. Y. Marquetta, O. Marquetta, Marquetta, Marquetta, Mich.
Tomas Converse	Boston, Mass. E Saginav, Mick. E Saginav, Mick. E Saginav, Mick. E Saginav, Mick. Lig Isl'd C'y, N. Y. Gloversville, N. Y. Fond du Lac, Wis. Fort Madison, Ia Jackson, Mich. Fort Wayne, Ind. Frontfort, Ind. Fredericton, N. B. Freebild, N. J. Houston, Texas, Palesdiae, Texas, Sagre, Pa. Augusta, Ga. Aulgsta, Mich.	Memphis Linescatur Div. So. & North Ma. Division. Louisville, Chord Ma. Division. Louisville, Chord Ma. Division. Choisville, Chew Albany & Chicago Louisville, New Albany & Chicago Louisville, N. Albany & St. Louiswille, N. Albany & Chewland, Marphiste, Illustrate, A. Chewland, Marquette, Houghth & Contonagin. Marphist & Little Rock.	Jan. 2000 dollery Jan. 2000 doller Jan.	J. Bowling Green, Ry. Mashville, Tean, Mashville, Tean, Mashville, Tean, Louisville, Ky. New Albany, Ind. New Albany, Ind. New Albany, Ind. Macon, Ga. Portland, Me. Nashua, N. H. Concord, N. H. Concord, N. H. Concord, N. Y. New York, N. Y. New York, N. Y. New York, N. Y. Marquetta, O. Marquetta, O. Marquetta, Marquetta, Marquetta, Marquetta, Memphis, Tean.
Tomas Converse	Boston, Mass, Fitchburg, Max, Fitchburg, Max, Fitchburg, Max, Fitchburg, Max, Fitchburg, Fitchburg, Fitchburg, Fitchburg, Fitchburg, Fond du Lac, Wis. Ford dwing, Fort Wayne, Ind. Foxburg, Pa. Frenkfort, Ind. Fredericton, N. B. Frechold, N. J. Houston, Texas, Frankfort, Frenkfort, Frenkfort, Frenkfort, M. B. Augusta, Ga. Aulgagan, Mich. Ga. Rapids, Mich. G. Rapids, Mich.	Memphis Allecatur Div. So. & North Ala, Division. Louisville, Chord Ala, Division. Louisville, Chord Ala, Division. Louisville, Chord Ala, Division. Louisville, So. Albary & M. Louisville, M. Albary, Louisville, M. Louisv	Jan and Control of the Control of th	. Bowling Green, Ry. Nashville, Tenn. Louisville, Ky. New Albany, Ind. Nashua, N. H. Concord, N. H. New York, N. Y. New York, N. Y. New York, N. Y. New York, N. Y. Marquette, Mich. Marquette, Mich. Smethport, Pa, Memphis, Tenn.
Tomas Converse	Boedon, Mass, Mach. Legislat Cy, N. Y. E. Sagrina w. Mich. Jacksonville, Fla. Legislat Cy, N. Y. Fond du Lac, Wis. Fort Madison, Ia Jackson, Mich. Fort Madison, Ia Jackson, Mich. Frankfort, Ind. Fredericton, N. B. Freehold, N. J. Freehold, N. J. Houston, Texas, Palestine, Texas, Augnsta, Ga. Rapids, Mich. G. Rapids, Mich. G. Rapids, Mich.	Memphis Lines, and Pirkson, Memphis Lines, and Pirkson, Memphis, M	Jas. soniconiery Jas. soniconiery B. Dunham Wm. Mahl. Wm. Mahl Wm. Mahl. Wm. M. Lewis E. Yeerkand. Press E. Yeerkand. Press E. Yeerkand. Press Payson Tung H. E. Chamberlin H. G. Chamberlin H. E. Chamberlin H. G. Chamberlin H. G	Bowling Green, Ry. Birmingham, Ala. Louisville, Ry. New Albany, Ind. Necon Ga. Portland, Me. Nashua, N. H. Concord, N. H. Concord, N. H. Concord, N. Y. New York, N. Y. New York, N. Y. Chechmadi, O. Marquette, Mich. Smethport, Pa. Memphis, Tenn. Hunsville, Ala. Hunsville, Ala. Hunsville, Ala. Hunsville, Ala.
Tomas Converse	Boston, Mass. Fichburg, Mach. Jacksonville, Fla. Lig lald Cy, N. Y. Glöversville, N. Y. Glöversville, N. Y. Fort Madison, Ia Jackson, Mich. Fort Wayne, Ind. Foxburg, Pa. Freehold, N. J. Freehold, N. J. Freehold, N. J. Augusta, Mich. Augusta, Mich. G. Rapids, Mich.	Memphis Linescatur Div. So. & North Ma. Division. Louisville, Chord Ma. Division. Louisville, Chord Ma. Division. Coulsville, So. & North Ma. Division. Louisville, So. & Louisville, Mancon & Konson, So. & Louisville, So. & Louis	Jan. and monoconey Jan. and monoconey Jan. and Jan. Wm. Mahl. Jan. Jan. Jan. Jan. Jan. Jan. Jan. Jan	Bowling Green, By Birmingham, Ala. Louiswille, Kry Low Albany, Ind. New Albany, Ind. New Albany, Ind. New Albany, Ind. New Albany, Ind. New Albany, Ind. New York, N. Y. New York, N. Y. New York, N. Y. Chechmati, O. Marietta, O
Tomas Converse	Joston, Massas, Mesh. Jackson Miss. Lag list'd Cy. N. Y. Lig list'd Cy. N. Y. Y. Fond du Lac, Wis. Prothering the Prochung, Pr. Prochung, Ps. Prochung, N. J. Frankfort, Ind. J. Prechold, N. J. Houston Texas. Pale-silber Texas. Sayro, Ps. Aligansia, Gs. Alliegan, Mish. Gr. Kapids, Mich. Fort Wayne, Ind. G. Rapids, Mich. Fort Wayne, Ind. Rootton Texas. For the Proches of the Pr	Memphis Lines, and Pivision Louisville, New Albany & Chicago Louisville, Chedimati & Lexington Louisville, Chedimati & Lexington Louisville, New Albany & Chicago Louisville, Na Albany & M. Louisville, Na Albany & M. Louisville, Na Chicago & Louisville, Na Albany & M. Louisville, Na Chicago & Manchester & Keene.  Manchester & Lawrence.  Manchester & Keene.  Manchester & North Weare.  Manchester & North Weare.  Manchester & Lawrence.  Manchester & Louisville, North M. Manchester & Lawrence.  Manchester & Louisville, M. Manchester & Lawrence.  Manchester & Lawrence.  Marchetta & Chocimati Cleveland.  Marquette Hought'n & Ontong'n.  McKean & Buffalo  Memphis & Hittle Book.  Memphis & Charleston.  Memphis & Charleston.  Michigan Central.	Jan. 2000 dones of the control of th	Bowline forea, Ry. Brimingham, Ala. Berningham, Ala. Louisrille, Ky. Mayon, Gd. Macon, Gd. Macon, Gd. Jordan, J. M. Macon, Gd. Jordan, M. Macon, Gd. Macon, Gd. Jordan, M. Macon, Gd. Macon, Gd. Macon, Macon, Gd. Macon, Macon, Gd. Macon, Macon, Gd. Macon, Gd. Macon, Macon, G
Tomas Converse	Joston, Massas, Josephan, Massas, Massas, Mish, Jacksonville, Fia, E Sagimas, Mish, Jacksonville, Fia, E Sagimas, Mish, Jacksonville, Fia, Fort Madison, Ia, Fort Mangare, Mish, Mis	Memphis Linescatur Dv. So. & North Ma. Division. Louisville, Chorinata Lexington. Louisville, Chorimati & Lexington. Louisville, See Albany & Chicago Louisville, S. Albany & C. Louisville, S. Louisville, S. Albany & C. Louisville, S. Lou	Jas. and controlled a	. Bowline Green, Ky. Brimingham, Ala. Lousville, Ky. Blirmingham, Ala. Lousville, Ky. New Albany, Ind. Macon, Ga. Portland, Me. Nacon, Ga. Portland, Me. Nacon, Ga. Concord, N. H. New York, N. Y. New York, N
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Tomas Converse	Joston, Massas, Josephan, Massas, Josephan, Massas, Josephan, Machalackson Tille, Fla. Esagrims, Mich. Jackson Tille, Fla. Light and Cip. N. Y. Fond du Lac. Wis. Fort Madison, In Fort Wayne, Ind. Forty Mayne, Ind. Forty Mayne, Ind. Houston, Texas, Palestino, Texas, Palestino, Texas, Palestino, Texas, Augusta, Ga. Alliegan, Mich. G. Rapids, Mich. London, Ont. London, Ont.	Memphis Linescatur Dv. So. & North Ala, Division. Louisville, Checimati & Lexington. Louisville, Checimati & Lexington. Louisville, Checimati & Lexington. Louisville, See Albany & Chicago Manchester & Reene. Macon & Brunswick Manchester & North Weare. Marchita, Pittsburg & Cleveland. Marchata, Pittsburg & Cleveland. Memphis & Little Book. Memphis & Little Book. Memphis & Lattle Book. Memp	Jan. and controlled a	Bowline Green, Ky. Brimingham, Ala. Lousville, Ky. Blirmingham, Ala. Lousville, Ky. Blirmingham, Ala. Lousville, Ky.
Tomas Converse	Joston, wasasa, Joston, wasasa, Joston, wasasa, Joston, wasasa, Joseph E. Sagrima, Mich. Jacksonville, Fla. Elgisl'd Cy, N. Y. Fond du Lac, Wis. Fond du Lac, Wis. Fort Madison, Ia. Jackson, Mich. Jackson, Mich. Jackson, Jich. Jackson, Jich. Jackson, Jich. Jackson, Jich. Jackson, Jich. Jackson, Jich. Jackson,	Memphis Lines and Pivision Louisville, New Many & Chicago Louisville, Cheimati & Lexington Louisville, Cheimati & Lexington Louisville, Sew Many & Chicago Louisville, Sew Many & Chicago Louisville, S. Albarry & St. Louis Macon & Brusswick Maine Central	Jan Somogoney Jan Somogoney B. Dunham Wm Mahl Wm Mahl Wm Mahl E. Sweland Pres L. Sweland R. Sweland L. Sweland R. Sweland L.	Bowling Green, Ny. Brimingham, Ala. Louisville, Ky. Mayon, Ind., New Albany, Ind., New York, N. Marjetta, O. Marjett
Tomas Converse	Joston, Masa- Boston, Masa-  Boston, Masa- Boston, Masa-  Boston	Memphis Linescatur Dv. So. & North Ala, Division. Louisville, Cincinnati & Lexington. Louisville, Cincinnati & Lexington. Louisville, Cincinnati & Lexington. Louisville, S. Abhary & C. Louisville, S. Abhary & S	Jan. and controlled a	Bowline Green, Ky. Birmingham, Ala. Lousville, Ky. Birmingham, Ala. Lousville, Ky. Birmingham, Ala. Lousville, Ky. Birmingham, Ala. Lousville, Ky. Washan, M. Washan,
Tomas Converse	Joston, Masasas, Josephan, Masasas, Mich. Jacksonville, Fla. Sagrimas, Mich. Jacksonville, Fla. Lyg laid Cy, N. Y. Fond du Lac, Wis. Fond du Lac, Wis. Fond du Lac, Wis. Fond du Lac, Wis. Fond March Jackson, In. Jackson,	Memphis Linescatur Div. So. & North Aia, Division. Louisville, Chord Aia, Division. Louisville, Chord Aia, Division. Louisville, Chord Aia, Division. Louisville, Chord Aia, Chicago Louisville, S. Albarry & M. Louisville, S. Al	Jas. and controlled and a controlled and	Bowling torea, Ry, 1988.  Birmingham, Ala Lousville, Ky, 1989.  Birmingham, Ala Lousville, Ky, 1989.  Birmingham, Ala Lousville, Ky, 1989.  Macon, Ga, Macon, Ga, Macon, Ga, Macon, Ga, Macon, Ga, Wang, 1989.  Macon, Ga, Macon, Ga, 1989.  Macon, Ga, Macon, Ga, 1989.  Maryotta, Wang, 1989.  Maryotta, Wang, 1989.  Maryotta, Ga, 1989.  Maryotta, Manayotta, Manayotta, Manayotta, Manayotta, Malayotta, Manayotta, Malayotta, Malayotta
Tomas Converse	Joston, Mass.  E. Sagimas, Mich. Jacksonville, Fia.	Memphis Linescatur Dv. So. & North Ala, Division. Louisville, Cincinnati & Lexington. Louisville, N. Albany & St. Louis. Macon & Brunswick. Maine Central. Macon & Brunswick. Maine Central. Manchester & Keenemer. Manchester & Keenemer. Manchester & North Weare. Marquette, Hought'n & Ontonag'n. McKean & Buffalo Memphis & Little Book Memphis & Little Book Memphis & Lattle Book Memphis & Careleston Memphis Paducah & Northern. Michigan Central. Mi	Jan and Ground College	Bowline Green, Ky. Birmingham, Ala. Louwrille, Ky. Birmingham, Ala. Louwrille, Ky. Birmingham, Ala. Louwrille, Ky.
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St. Louis Division	E. Culverhouse	.H. W. Gardiner	St. Louis, Mo	Col., Cin. & Ind., Cent. Div.	J. Hill	Logansport, In
Naugaruck	Geo. W. Beach	Geo. W. Beach.	Waterbury, Conn.	Indianap. & Vincennes Div	E. W. McKenna	
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New Haven & Northampton	E. S. Quintard	C. N. Yeamans.	New Haven, Conn	Pittsburg & Western Pittsburg Titusvilla & Puffalo	.G. A. Woerth	
New Jersey & New York	J. D. Hasbrouck.	.C. N. Teamans.	Jersey City, N. J.	Pittsburg, Titusville & Buffalo.	Joh	in L. Awl Pittsburg, Pa.
New Jersey Southern.	W. E. Lewis		Jersey City, N. J.	Port Dover & Lake Huron	J. M. Byers	
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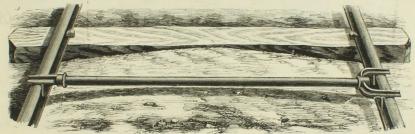
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The forked end, which has two lugs which bear against the rail, secures a perfect gauge, even in the hands of a careless section-man, as it requires no judgment or correct eye to place the gauge exactly perpendicular to the rail, and it is also an important feature of this implement that even if it be swung as much as six inches out of perpendicular, it will not cause a variation in the gauge of more than one-thirty-second of an inch, whereas it is easy and not uncommon in using an ordinary gauge, to place it so carelessly as to cause a variation of from one-half inch to one inch.

At and near frogs and switches, and where a guard-rail lies within the track, this gauge is particularly convenient and useful, as the lugs at each end project down so far that the implement stands clear of any intervening obstacles. At such points and on curves, where an accurate gauge of the rails is most difficult to be secured, and at the same time most desirable for economy in operating the road, this gauge saves the time of section-men, and in one respect, at least, secures good work from them.

It is inexpensive, and not breakable with ordinary usage.

Wherever it has been used, the road-masters and section foremen indorse it heartily. The following are some of the companies which have adopted it, and, as the excellence of the permanent way of these roads is well known, their practical indorsement is worthy of note:

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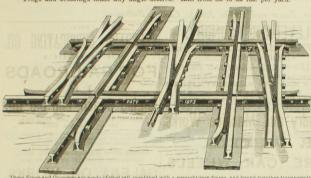
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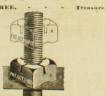
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